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Teaching Children who have a Mild Developmental Disability Through Interpretative Programmes

C. A. Martynuik ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Arts in Recreation.

Department of Recreation and Leisure Studies

Edmonton, Alberta
Fall, 1992

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October 2, 1992.

Dedicated to my Mom and
the memory of my Dad who said to me
when he talked about his life on the farm:

"You look after the children and the animals first
before you worry about yourself."

ABSTRACT

The purpose of this study was to design and test the effectiveness of in-service leadership training sessions for interpreters offering generic programs and services to children some of whom have a developmental disability (mild mental retardation). The question asked in this study was: "Do the Experimental Leadership Training Sessions have an effect on the interpreters in their presentation of interpretive programmes for children who have a mild developmental disability". A review of the literature was undertaken in order to develop a better understanding of: (1) children who have a mild developmental disability with regard to cognitive ability and other developmental areas; (2) some of the facets of interpretation including the roles interpreters employ; (3) interpretative programmes for people who have a disability; and (4) various teaching methods and strategies that are most beneficial to children who have a mild developmental disability.

The design of the study included two populations: (1) a group of adults, participating in a leadership training programme, who were provided with information on the mechanics of presenting a natural history interpretive programme; and (2) children, from the ages of 9 to 12 years, who have a mild developmental disability. Each participant was match paired with a peer in his or her population. The study was designed as a field experiment with one half of each matched pair randomly assigned to the control or the experimental group.

The experimental group of interpreters were presented with in-service leadership training sessions which focused on learning strategies that help children (9 to 12 years old) who have a developmental disability (mild mental retardation) acquire information. The control group of interpreter's in - service leadership training sessions focused only on how the general population of children (9 to 12 years old) learn.

The data was collected using self-administered questionnaires and video tapes of the natural history programme that the adult interpreters, experimental and control, presented to children who have a mild developmental disability. The video-tapes were scripted and then analyzed with regard to their usage of nine teaching methods.

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I would like to acknowledge the people who have helped and supported me in various stages of my thesis work:

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CHAPTER ONE

Problem Formulation

Introduction

Leisure, recreation, health. Over the last few decades these terms have been linked together with wellness, well-being and quality of life. This relationship has been documented by authors such as Goodale and Godbey (1988), Goodale and Witt (1985) and Murphy (1975) who have written about the historical development of the leisure and recreation delivery system to its present day importance. Everywhere we turn we are told of the importance of leisure and recreation to our physical, psychological and spiritual well-being. This message is being sent to everyone with no distinction of race, creed or ability.

More and more agencies and governments have been developing and promoting their leisure and recreation programmes, services and facilities for use by everyone in the community. In some cases this may mean that the staff in the agencies and government departments are having to make attitudinal changes along with the physical structural changes to facilities. For example in-service training seminars for staff may include such topics as cultural awareness; or information on various modes of communication such as the Blissymbolics board and American Sign Language; or information about children who have mild developmental disabilities. In-service training seminars which focus on such topics as mentioned above can help to make staff more knowledgeable about the people they are serving, techniques for communication and subject matter appropriate for the clientele. Along with in-service training seminars structural changes to buildings, such as, renovating facilities to make them accessible for people who use various types of mobility aids, for example, wheelchairs or motorized wheelcarts, may be needed. These types of changes help to provide a broader range of choices to people who have a physical and or mental disability.

One service area in the leisure and recreation delivery system that is starting to provide more choices to people who have varying disabilities is that of natural history interpretation (i.e., the interpretation of objects, sites and processes). Some examples of agencies which may provide natural history interpretative services and programmes within communities are environmental centres, science centres, nature centres, parks and museums.

In the field of interpretation it is necessary for the staff, especially the interpreters, to understand: the subject and/or object they are interpreting, and the nature and diversity of their visitors. This is expounded by Tilden (1977) who stated "any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile" (p. 9). If the staff are provided with pre- and in-service training and updated information through such means as seminars, courses, workshops, research reports and practical experience (in order to acquire the necessary knowledge and experience) then the services and programmes they offer can be effective and accessible. Hence, visitor services will see an increase in client numbers, such as the inclusion of children, who have a physical and/or mental disability.

Studies which have focused on interpretation in museums, and environmental centres for children with varying disabilities have included some form of in-service training for the staff (Bardt-Pellerin, 1981; Hornfeldt, McAvoy & Schleien, 1989; McAvoy & Schleien, 1988; Schleien, Ray, Soderman-Olson & McMahon, 1987), yet there are few published studies, articles or reports which describe the process of pre- or in-service training (Schleien & McAvoy, 1989). Therefore, there is a need for the development and publication of such studies involving children who have mild developmental disabilities accessing natural history interpretative programmes where staff preparation and accessibility have been addressed.

Purpose of the Study

The purpose of this study was to design and test the effectiveness of in-service leadership training sessions for interpreters who offer programmes and services to children who have mild developmental disabilities. The specially designed in-service leadership training session was taken by an experimental group of interpreters. After its completion an observational technique was employed to assess the interpreters delivery of natural history interpretative programmes to children who have mild developmental disabilities.

As a part of this study a leadership training manual was developed and will be made available to administrators and interpreters in order to make more accessible their agencies programmes and services to children who have mild developmental disabilities.

Statement of the Problem

The primary focus of this study was to address the needs of interpreters seeking to relate to children who have mild developmental disabilities. This was done by providing the interpreters with information on (1) effective teaching techniques to use with children who have mild developmental disabilities, and (2) research that identified learning strategies used by children who have mild developmental disabilities (Das,1972, 1973a, 1973b; Das & Bower, 1971, 1973; Das & Cummins, 1978; Das, Kirby & Jarman, 1979). The above stated problem was addressed through the answering of the following question:

> Do the Experimental In-Service Leadership Training Sessions have an effect on the interpreters in their presentation of interpretative programmes for children who have mild developmental disabilities?

Significance of the Study

This study is significant in the areas of applied and theoretical research. In the area of applied research this study produced a manual (In-Service Leadership Training Manual) that focused on the training of interpreters in order for them to effectively modify and present an interpretative programme to children who have mild developmental disabilities. The expected impact of the Experimental In-Service Leadership Training Sessions on the interpreters was to have lead to an awareness of the different strategies children who have mild developmental disabilities use to process information. A second expected impact on the interpreters was on their ability to adapt a regular interpretative programme to better suit children who have mild developmental disabilities.

In the area of theoretical research the study linked the interpreters, docents and environmental educators with various developmental theories that had been integrated into information processing systems which could then be applied to the field of interpretation.

The information and knowledge gained from this study sought to accomplish five objectives.

(1) It sought to assemble the most recent information that was available in order to give direction to interpreters, docents, and environmental educators on the cognitive process of children who have mild developmental disabilities;

(2) It sought to develop a programme outline, which focused on children who have mild developmental disabilities, that can be used in the education of natural history interpreters, docents and environmental educators ;

(3) It sought to describe techniques that would allow interpreters, docents, and environmental educators to modify regular children's programmes for successful use with children who have mild developmental disabilities;

(4) It sought to complement past research that has been undertaken in the area of information processing and interpretation. These areas were integrated with a focus on children who have mild developmental disabilities;

(5) It sought to identify pertinent areas that still need to be studied and/or areas that need more research for verification for specific applicability.

The results of the first three objectives, which come out of applied research, appear in the In-Service Leadership Training Manual. The fourth objective focuses on the application of theoretical research in the field of interpretation while the fifth objective exposes areas of theoretical research that still need to be explored and applied.

Summary

Chapter One identified the research problem and question along with five objectives that were to be accomplished in this study. The following chapter will examine a review of literature that was the basis of this study.

CHAPTER TWO

Review of Literature

Introduction

Interpretative services, programmes and facilities offered by various agencies differ in their degree of accessibility to persons with disabilities. While some are fully accessible, many are not. This includes interpretative programmes and services for children who have disabilities. The main purpose of this literature review will be to focus upon the components that are necessary to educate interpreters in the reasoning for and the techniques employed to modify interpretative programmes for children who have mild developmental disabilities.

The following review will examine four main areas that form the basis for this study. The first section will focus on children who have developmental disabilities with respect to five specific developmental areas. The second section will examine "interpretation" and some of its major elements. As the researcher has not been able to locate literature focused primarily on interpretative programming for children who have mild developmental disabilities the third section will review a variety of integrated and segregated interpretative programmes that are offered to people, mainly children, with a variety of disabilities. The fourth section will look at modifications that are needed in order for these children to obtain the most benefit from an interpretative programme.

Various Developmental Areas with regard to Children who have Developmental Disabilities

The growth potential of children who have developmental disabilities has been an active area of research since the late 1960's and early 1970's (Das, 1972, 1973a 1973b; Das & Bower, 1971; Ellis, N. R, 1963, 1966, 1970; Holden, 1965, 1970). Such disciplines as rehabilitation medicine, education, psychology, physical education and recreation continue to research the physical, social, emotional and intellectual development of these children. The purpose of this section is to examine developmental areas in children who have mild developmental disabilities in order to understand the behaviour of these children from the point of view of their capacity to learn.

Cognitive Development

Two cognitive growth theories to be discussed with regard to developmental disability in this section are (1) Piaget's development theory (Grossman, 1983) and (2) the difference or defect theory (Das, 1972; Das & Cummins, 1978). The developmental theorists believe that all children, even those who have developmental disabilities, follow the same sequence of cognitive growth. The difference theorists state that there is a qualitative difference in the cognitive development of individuals who have developmental disabilities.

With regard to the developmental theorists, the steps in cognitive growth which individuals go through from infancy to adulthood are shared by all including those people who have developmental disabilities (Bliss, 1985; Carter & Ormod, 1982; Grossman, 1983; Hewett & Forness, 1984). The cognitive development of individuals is along a continuum with Piaget's sensorimotor stage at one end, formal thinking at the opposite end and the other three stages (preoperational-transductive, preoperational-intuitive and concrete thinking) in between (Grossman, 1983). The only difference between those who have and those who do not have developmental disabilities is the rate at which the individual passes through the stages.

From a developmental theorist's perspective children who do not have adevelopmental disabilities are, at the age of 9 to 12, in a transition period whereby they are moving from the stage of concrete thinking into the stage of formal or abstract thinking when it comes to describing themselves (Silon & Harter, 1985). Whereas those children who have developmental disabilities and are of the same chronological age are still using words that are associated with the concrete thinking stage (Silon & Harter, 1985) when they are talking about themselves. Thus, these children who have developmental disabilities are still going from Piaget's pre-operational - intuitive to the concrete thinking stage. The children who have developmental disabilities have not developed cognitively in as complex a fashion as those children who do not have developmental disabilities (Bliss, 1985, 1986; Grossman, 1983; Silon & Harter, 1985).

Silon & Harter (1985) revealed that the motivational force of children who have developmental disabilities appears to be related to the amount of difficulty versus ease with which the task, such as schoolwork, may be performed. Children who have developmental disabilities appear to ask "what" based questions, for example "What do I want to do?" (Silon & Harter, 1985, p. 228). Children who do not have developmental disabilities, and are of the same chronological age, are more focused on the "why" based questions, for example, "Why should I do that?" (Silon & Harter, 1985, p. 228) . The results of the studies reviewed above showed that the children who do not have developmental disabilities had advanced or were in transition from Piaget's concrete thinking to his formal thinking stage, while the children who did have developmental disabilities were a stage behind. Pasnak, Campbell, Perry and McCormick's (1989) study also indicated that children who have mild developmental disabilities do advance into the concrete thinking stage.

Pasnak, et al., (1989) have shown that external rewards, feedback, mastery and the use of manipulable objects used in teaching children, who have developmental disabilities, classification and seriation (i.e., arranging objects in order of size), can result in an increase in their mental age and IQ. Cole and Gardner (1988) also used rewards and feedback as motivational tools in their study with children who have developmental disabilities. These children learned to identify correct solutions to visual discrimination tasks. Both studies indicate the importance of using motivational tools in a training/learning approach with these children. The results from Pasnak, et al.'s (1989) and Cole and Gardner's (1988) studies show that there is a proportional increase in learning for children who have mild developmental disabilities to that of children who do not have developmental disabilities and that both groups benefit from external verbal feedback.

Difference theorists purport that there is more to developmental disability (mental retardation) than a developmental lag. Research has shown that children who have developmental disabilities have the capacity to use the same processes (simultaneous and successive processes) that are used by children who do not have developmental disabilities but that the difference is in the kinds of strategies used by each group to solve complex tasks (Das, 1972; Das & Cummins, 1978; Molloy & Das, 1980). Children who have mild developmental disabilities may have to remember a picture in its total form (simultaneous mode) if they are to reproduce it, whereas children who do not have developmental disabilities would more likely remember it in a sequential form (successive mode) (Das, 1972; Das & Cummins, 1978; Molloy & Das, 1980). Thus, those individuals who have developmental disabilities have "deficits in planning and coding" (Molloy & Das, 1980).

Another area in which studies have shown that children who have developmental disabilities are deficient is in transference. Children who have developmental disabilities are not able to transfer a strategy they have used in a general situation to a more specific situation. This inability is referred to as **'far transfer'** (Das, 1985a). For example a study of far transfer was undertaken by Das (1985a) which had children who have and do not have mild developmental disabilities participate in a training programme that did not contain any materials related to reading or teaching skills related to reading. The children who do not have mild developmental disabilities were able to transfer the skills that they learned from the training programme, that of coding and planning, to the task of reading. Whereas the children who have mild developmental disabilities were unable to do this far transfer.

Das and colleagues (Das, 1985a, 1985b; Das, Kirby & Jarman, 1979) have proposed that an IQ of 70 is the threshold limit to far transfer, and anyone at or below this threshold "could not take the 'induction leap' " (Das, 1985a, p. 676) that is needed to transfer a general principle to a specific situation. The study by Campione, Brown, Ferrara & Bryant (1984) concurred with the results from the above studies. Campione et al. found that the children who have developmental disabilities had difficulty in transferring what was learned to other problems and were inflexible in the way they used the information. These children had "difficulty in identifying novel examplars of known problem types that [were] not clearly marked by context" (p. 85) even with adult prompting and support. That is, the children who have developmental disabilities were unable to take the induction leap which is required in order for far transfer to occur.

An area in which children who have developmental disabilities do not seem to be deficient in is in attentional processes. From a series of studies Das and Bower (Bower, 1973; Das & Bower, 1971) have found that in a laboratory environment children who have developmental disabilities were able to "maintain orientating responses under self-instruction as adequately as" (Das & Bower, 1973, p. 175) children who do not have developmental disabilities. Das (1973a) concurred with the above studies by stating that a learning environment that is "noise-free" and "without any distraction" (p. 103) helps children who have developmental disabilities to attend to tasks more efficiently than in a regular classroom. From the studies reviewed it can be said that the learning environment is an important factor for children who have developmental disabilities with respect to attending to tasks and activities.

Das (1985b) proposed an alternate way for children to learn and transfer general strategies and that is by providing them with real life experiences which require the use of specific skills which can be "practiced in a variety of instances" (p. 89). This "would allow individual variations in coping with tasks. Each individual may work out his or her own unique approach to the variety of tasks presented during structural experiences" (p. 89). This approach would parallel the way people who do not have developmental disabilities learn strategies and then transfer the strategies to a new experience.

Developmental theorists have shown that children who have developmental disabilities can and do progress, at a slower rate, to the concrete thinking stage and that they have problems with concrete thinking. The difference theorists have shown that these children do process information differently from children who do not have developmental disabilities, especially when complex tasks are to be performed. The difference theorists have also revealed: (1) that under the correct learning condition children who have mild developmental disabilities can orientate and focus on a task and therefore may not necessarily have an attention deficit; and (2) that these children are unable to perform the cognitive skill of far transfer. In relation to these two possible conflicting theories Das (1973c) states that which ever theory a researcher works from it is critical that he or she keep an open mind to the results of other theorists' research in order to better "understand and explain mental retardation [developmental disabilities]" (p. 750). The understanding of the social, emotional and physical development of children with a mild developmental disability are also as important as knowledge about their cognitive functioning, for each of these variables interact with each other.

Socialization

One of the criteria in the American Association of Mental Deficiency's (AAMD) definition of developmental disabilities (mental retardation) is the exhibiting of inappropriate behaviour in social situations (Grossman, 1983). Children who have developmental disabilities often demonstrate more inappropriate behaviour and have a harder time interpreting social messages (Maheady, Maitland & Sainato, 1985) and do not progress at the same rate in the area of moral maturity (Lind & Smith, 1984). These children have been shown to be deficient in being able to provide different ways in solving social problems, therefore the children may have a "smaller repertoire of known ways to solve common social problems in dealing with others" (Herman & Shantz, 1983, p. 225).

In the area of interpersonal problem solving skills students who have developmental disabilities tend to function at levels similar to their mental age (MA) matched peers who do not have developmental disabilities. If students who have developmental disabilities are matched with their chronological age (CA) peers there is a significant difference, that is, the CA peers use a broader repertoire of skills and seem to have a greater degree of social awareness than do their peers who have developmental disabilities (Smith, 1986).

Cooperation is another strategy that children who have mild developmental disabilities have used in social situations. There is some controversy as to the levels of cooperation exhibited by children who have developmental disabilities, but Lind and Smith's (1984) study indicated that these children, even prior to any instruction by the researcher, "evidenced consistently higher levels of cooperation than their ... counterparts" (p. 214) who do not have developmental disabilities. This finding is in agreement with Madsen and Connor's (1973) study but in disagreement with Rueda and Smith's (1983) results. Rueda and Smith compared their results with those of Madsen and Connor (1973) and stated that the discrepancy may be because each group of researchers placed different demands on the tasks used.

A different area of discrepancy with regard to the behaviour of children who have mild developmental disabilities is between special education teachers and regular classroom teachers. Teachers in special education classrooms were more positive about the behaviour of children who have developmental disabilities than were teachers in regular classrooms . The teachers in the special education classrooms perceived the children as being "more cooperative and less avoidant/withdrawn" (Taylor, Asher & Williams, 1987, p. 1331).

Gottlieb, Semmel & Veldman.'s (1978) study on children who have mild developmental disabilities in mainstream classrooms indicated that the social status of these students was related to how the peers' and teachers' perceived the children's behaviour and academic level. The length of time the children who have mild developmental disabilities spent in a regular classroom setting did not seem to effect how they were perceived (Gottlieb, et al., 1978).

In another comparison Taylor et al.'s (1987) study showed that children in special education classrooms who have developmental disabilities were observed to be more interactive and pro-social (communicative) then their peers who were mainstreamed. This observation of Taylor et al.'s agreed with a study undertaken by Myers (1976) which revealed that those students "in both special school and special class groups were significantly better adjusted socially than pupils [who have developmental disabilities] in regular classes" (Myers, 1976, p. 9). As a reminder to researchers and readers Morrison and colleagues have stated that it is important not to transfer the social status of children in one type of school placement into another since each situation has its own "pattern of independent variables" (MacMillan & Morrison, 1980, p. 441; Morrison & Borthwick, 1983).

In summary children who have mild developmental disabilities have been shown to be deficient in a variety of behaviour and social skills when compared to their CA matched peers. Yet, there is no solid agreement as to which skills are deficient. This adds weight to the fact that this is a group of heterogeneous children and that there are numerous independent variables which affect the social development as well as their physical, cognitive and behavioural development.

Adult Relationships

The manner in which adults react and respond to children who have developmental disabilities.affects the way the children behave. Research has indicated that the academic opinion of teachers of children who have developmental disabilities has an effect on the self-image of the children which also affects their total self-concept (Richmond & Dalton, 1973). This same study reported that teachers usually have no awareness of the social and emotional needs of students who have developmental disabilities which in turn would affect the students' academic achievement and self-concept. One way to help these students, who have developmental disabilities, develop a better personal and academic self-concept would be for teachers to reward or reinforce them for their abilities and for the schools to retain and promote the "affective component of education" (Carroll, Freidrich & Hund., 1984, p. 347).

Another study has revealed that children who have mild developmental disabilities are more dependent on adults for direction and feedback than those who do not have developmental disabilities (Silon & Harter, 1985) The children who have developmental disabilities are more reliant on " external structures and guidance from others" (Silon & Harter, 1985, p. 228). These children are also more concerned about their relationship with their teacher than with their peers. This is opposite of what has been revealed for children who do not have developmental disabilities (Silon & Harter, 1985).

Teachers have been shown to use a diversity of strategies when making judgements and decisions with regard to students in general and to how the class is managed (Borko & Cadwell, 1982). Included in the teachers' criteria for assessment are the students' personality characteristics. If students are active learners teachers may judge the students on how they behave and rate them accordingly (Borko & Cadwell, 1982; Kedar-Voivodas, 1983). If the students are given a low rating with regard to their behaviour they may develop a poor self-image. This seems to support the above paragraph, that is, whether the students have developmental disabilities or not their characteristics can affect the way teachers rate them.

Morrison & Borthwick (1983) state that there may be some sex biases when children are evaluated and warns against misinterpreting the data by not taking into account its framework. Hoge & Butcher (1984) dispute the effect of gender as a bias factor in teacher's judgements and identify the possibility of the student's IQ score as functioning as a biasing factor.

Research by Herman & Shantz (1983) indicates that mothers also have a major influence on their children who have developmental disabilities. Their study showed that the cognitive development of these children in the area of social problem-solving skills seemed to be related to the controlling force of the mothers. That is, it is the mothers who may or may not "limit their child's opportunities to engage in contact with people and activities outside the house" (p. 218). Herman & Shantz (1983) add that this external and internal social experience of the mother-child dyad has not been well researched and that such research needs to be undertaken in order to better understand this relationship and its effect on children who have mild developmental disabilities.

The area of adult-child relationship does not seem to be exempted from controversy. The relationship also appears to be limited by how adults (teachers or mothers) perceive the children who have developmental disabilities. The conclusion on the studies reviewed indicate that this perception can be negative, thereby, adding external constructs to the children's own internal (emotional) constraints. The negative perception by adults could cause the children to reduce their rate of emotional and psychological development even more than when they are not perceived in this way.

Emotional Development

The emotional development of children who have mild developmental disabilities is an important factor in the total development of these children and has been extensively researched with regard to educational placement. The type of educational placement of children who have developmental disabilities continues to be a controversial issue. The literature reviewed by Coleman and Fults (1985) revealed that children who have a mild handicap (includes children who have developmental disabilities) and were in special classes showed the highest increase in the level of self-concept compared to those who were "in regular classrooms or partially segregated in resource rooms" (p. 7). This statement is in contradiction to the literature cited by Carroll, et al., (1984), who conclude "that special education placement contributes significantly to pupil's [who have mild developmental disabilities] feelings of inferiority and problems of acceptance" (p. 347). Carroll, et al. go on to say that children who are labeled appear to rate themselves lower in academic self-concept than those children who do not have handicaps. Another study showed that there was no significant relationship between the personal perception of children in special classrooms with respect to their "self-concept among peers" (Richmond & Dalton, 1973, p. 182) to that of their teacher's perception of their academic achievement. As is indicated by the above studies there is no agreement as to which educational placement is best. The correct placement may really depend on the abilities of the children and in the type of educational opportunities that are available and most appropriate for them on an individual basis.

A place of agreement in the literature is in the comparison of children who do not have developmental disabilities to children who have developmental disabilities and levels of self-concept The latter group has been shown to have the lowest level of self-concept no matter where they are placed in the school system (Carroll, et al., 1984; Coleman & Fults, 1985; Polloway, et al., 1985; Jones, 1985; Morrison & Borthwick, 1983). With regard to self-concept and gender Carroll, et al.'s, (1984) study indicated that male students who have mild developmental disabilities have a higher self-concept than do female students who have mild developmental disabilities. Another relationship is between behaviour problems and gender. Male students who have developmental disabilities were more likely to have behaviour problems than females who have developmental disabilities except in the area of social withdrawal where the female ratings indicated a more serious effect, this was especially true for the elementary students (Polloway, et al., 1985). The behavioural problems lessened as their age increased. Both male and female students who have developmental disabilities were also rated as having significantly more behavioural and emotional problems than their peers who do not have developmental disabilities. This finding is in agreement with Maheady, et al.'s (1985) results.

The studies reviewed indicate that the perception of others, especially adults (e.g. teacher and mothers) and the educational setting affects the emotional development of children who have developmental disabilities. There is no consensus regarding which educational setting is best for these children. Yet, in whatever setting these children are placed their self-concept level is still lower than that of children who do not have developmental disabilities. The self-concept level of male students with a mild developmental disability is greater than females with a mild developmental disability, and overall these students have more emotional problems than those without a mild developmental disability.

Motor Development

Individuals who have developmental disabilities may be fairly close to their peers who are normal in the area of motor development especially with gross motor skills (Francis & Rarick, 1960; Malpass, 1963) and in physical size

(Westling, 1986). There is a delay of two to four years in children's (8 to 14 years) performance of complex motor skills. This delay is "dependent on the age and IQ group considered and the types of motor performance evaluated" (p. 608). This discrepancy between the two groups continues to increase as individuals grow older. Some of the complex motor skills which may decrease with the advancement of age are those which make use of power, strength and agility (Francis & Rarick, 1960). Thus, a well planned out physical activity programme throughout the life of those individuals who have developmental disabilities would help them to reduce the distance between themselves and their peers in the area of complex motor skills (Francis & Rarick, 1960; Westling, 1986).

Broadhead and Church (1984) investigated the physical dexterity of children who have mild developmental disabilities and those who have a moderate developmental disability. The results revealed that every child was at a different level of motor performance and varied in his or her physical dexterity. For example, the range for children who have mild developmental disabilities included those levels that were: (1) expected for children who have a moderate developmental disability who were at the lower end; and (2) at the higher end which had children in the regular kindergarten and Grade one programmes.

In conclusion children who have mild developmental disabilities vary in their motor skill ability and in their physical dexterity but may still be behind their CA matched peers who do not have developmental disabilities. Yet if the children who have mild developmental disabilities are enrolled in a physical activity course the gap between the two groups could be decreased.

Summary of the Various Developmental Areas with regard to Children who have Developmental Disabilities

The studies that have been reviewed with regard to the development (cognitive, social, adult relations, emotional and motor development) of children who have mild developmental disabilities clearly reveal that even though there are group similarities there are also individual differences. Even if two children with a developmental disability are the same age and have the same IQ it does not mean that their cognitive, social, emotional or motor development levels are identical. A number of variables can affect the overall development of these children. No universal agreement has been reached regarding such areas as the cognitive functioning and social skills of these children who have mild developmental disabilities . The research does show that those who are labeled developmentally disabled are not a homogeneous group and because they vary in their intellectual, social, emotional and physical development, interpreters must give due consideration to their individual abilities as they prepare experiences for these clients.

Interpretation

Interpretation involves interaction with people of all ages and backgrounds through some type of a communication process involving a subject which may include objects, sites and/or processes. The item being interpreted may or may not be physically present, but the information presented about the item may be new or presented in such a manner that a new and different way of viewing the object, site or process is revealed (Edwards, 1979; Tilden, 1977).

Programmes for Children

Programmes for pre-school and school children should be developed especially for them whether they are of an environmental nature or not. Programmes as stated by Tilden (1977) "should not be a dilution of the presentation to adults, but should follow a fundamentally different approach" (p. 9), especially for children who have mild developmental disabilities. This same feeling and belief has been expounded in other literature (Butler, 1974; Cole, 1984; Jensen; 1982; Machlis & Field, 1974; Rejeski, 1982). The common belief held by these authors is that children are not adults and that their views, thoughts and the way they process information are different from those of adults.

Children's experiences are also far more limited than those of most adults. One way of expanding experiences, especially for children who are physically and/or developmentally disabled is through hands-on experiences which help to facilitate the use of all or most of their senses (Cole, 1984). This type of experience is instrumental in helping the children build concepts "around and through objects" (Herbert, 1980, p. 34) and it can prepare them to experience more novel situations.

Placing children and people of all ages in novel situations with which they have no prior involvement, or knowledge, can result in them fearing that experience. People tend to fear what they do not understand and in this regard children are no exception (Butler, 1974). Children have three basic fears: (1) fear of the dark, (2) fear of being alone, and (3) fear of wild animals. These fears are not only based on their insecurity about the unfamiliar but on their "lack of awareness and understanding of the environment" (p. 3). With this being so, then steps should be taken to prepare children to have a special and good experience. One way to prepare children is to provide them with a pre-experience, that is with a glimpse of what they are to expect of the experience, the facility, of themselves; and what the teacher and interpreter would expect from them (Margetts, 1982).

Pre-experiences or pre-visitation programmes are acknowledged as important by many educators (Tilden, 1977; Butler, 1974; Margetts,1982). Distinct differences have been noticed between those children who were prepared prior to their trip and those children who were not prepared (Margetts, 1982). Those children who lacked this pre-experience "generally showed less interest, little motivation, and were less enthusiastic about the on-site programme" (p. 74). For Butler (1974) it is a matter of setting the stage and allowing the children to do the rest; "an appreciation for the outdoors" (p. 4) or any other setting can not be forced.

In setting the stage educators and interpreters who plan and implement programmes need to consider the fact that the children they will be working with may be at different ability and cognitive levels (Machlis & Field, 1974). Thus the children's interests, and how they learn and relate to peers and adults will vary. Machlis and Field discuss these areas and others with respect to "'connecting' ... [interpretative] programmes with children" (p. 1). To make the connection requires that interpreters understand: (1) the different developmental aspects of children's growth and how these differences can either limit or provide opportunities for the children; (2) the importance of social groups and the affect they have on interpretation; and (3) make use of action, fantasy and instruction as the basic approaches in any interpretative programme. In order for the three requirements to work a successful flow of communication has to take place .

Communication, as described by Edwards (1979), is a process without which interpretation would not happen. This process (Edwards, 1979) or flow

(Machlis & Field, 1974) is composed of various components as illustrated in Figure 1. For Edwards (1979), interpretation is an art and the interpreter is an artist. The manner in which the interpreter applies his or her creative abilities in communicating the message to visitors or the audience can determine the interpreter's success. The method or medium of communication and the setting or social situation that Machlis and Field (1974) include in their model (see Figure 1) are part of the stage that should be creatively developed and used in the presentation of the interpreter's message. This communication flow or process continues on to the visitors or audience who then react to the message that they are receiving. It is then up to the interpreter to receive the visitors feedback from the message react to it by adjusting his or her own message or continuing on as planned. The communication flow or process is only successful if all components are functioning properly. If even one component is faulty the result is a communication breakdown. If a breakdown happens, then the interpreter would need to evaluate the whole process in order to identify the problem and restore the flow of communication.

In the communication flow or process Machlis and Field, (1974) and Edwards (1979) identify the visitor, for example the child, as the receptor of the interpretative message. Machlis and Field (1974) point out that motivation is an important element in connecting children to the interpretative message that is the focus of the programme that they are participating in. Machlis and Field state that certain motivators are related to specific developmental stages as well as to the type of social context in which the children are situated. Variables that affect the social context of a group of children are: (1) their purpose, which is usually defined by the agency, interpreter or teacher; (2) the size of the group; and (3) the composition of the group - children at or in transition between different developmental phases. Machlis and Field include information on the physical development, cognitive development, socialization, and adult relations with respect to four different age groupings of children. With the above information interpreters should be able to plan and develop programmes that are appealing to and challenging for children of all ages.

Developmental aspects, school age and social context are three areas that need to be considered by the interpreter when he or she plans and implements interpretative programmes for children. Thus, in order for the

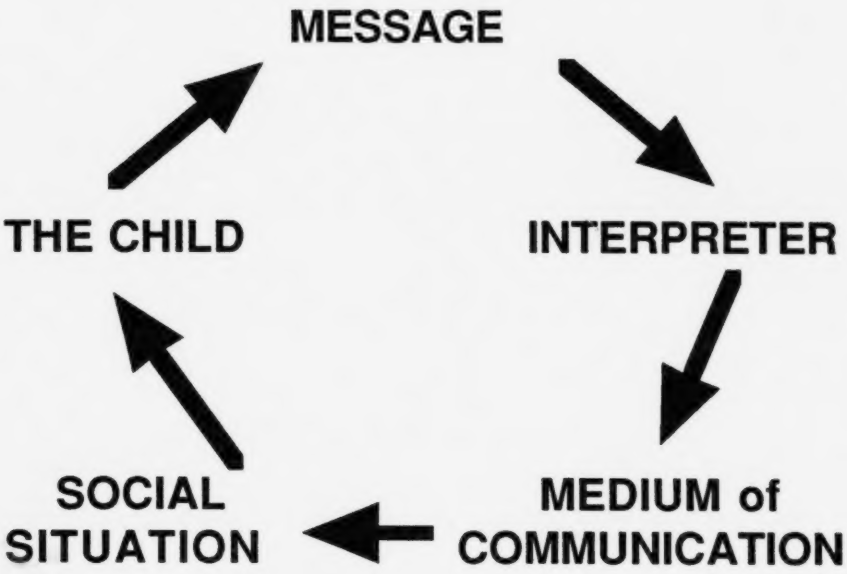
MESSAGE
INTERPRETER
MEDIUM of COMMUNICATION
SOCIAL SITUATION
THE CHILD

Figure 1. How Communication Flows. Adapted from Machlis and Field, 1974, p.2. Used with permission (1992).

interpreter to be successful, he or she must understand how children physically and developmentally function and have the ability to apply such an understanding when sharing the message. Another major component for a successful interpretative programme is the communication process or flow which is also the responsibility of the interpreter. No one benefits when communication breaks down.

Theoretical Framework for Interpretation

Various articles have been written in the interpretation field about the importance of and the need to link interpretation to a theoretical framework based upon the developmental process of individuals. Rejeski (1982) states that since environmental education is not only concerned with the environment but also with human development, interpreters should first gain an understanding of how children develop. This knowledge would help interpreters to better understand the cognitive growth of children and provide a base to work from when they plan and implement programmes and events. Different frameworks, or conceptual bases, that will be introduced in this section are Piaget's Developmental Theory, cognitive mapping and the affective domain.

One developmental theory that has been discussed and supported by various authors is that of Piaget (Cole, 1984; Jensen, 1982; Machlis & Field, 1974; Rejeski, 1982). The basis for this developmental theory is that all children go through the same developmental stages, only some may be slower (i.e., children who have developmental disabilities) or others may be faster (i.e., children who are gifted). Children who have developmental disabilities may never complete all the developmental stages (Grossman, 1983). Jensen's (1982) paper, which is a composite of four short articles written by different individuals, incorporates the Piagetian Theory into the planning of interpretative programmes for children, teenagers and adults. Each of these first three articles expand and interconnect the theory for the specific age group that the researchers discuss. The fourth article provides an example of how one museum used the developmental theory as a basis to plan and implement separate programmes for each group around a common theme with a total of seven programme themes, each lasting about one month. The motivation behind the articles, which were a result of a panel discussion held in 1981 at the American Association of Museum's (AAM) Annual Meeting, stem from the need and concern for understanding the people who visit the museums so that better programmes could be developed and implemented. In a separate article by Cole (1984) the importance and relevance of interpreters having a background in the area of child development is discussed. With the "proliferation of specialized programmes and specialized museums" (p. 11), such as, children's museums, and the increase in the diversity of people now coming to museums, interpreters will require information in order to provide relevant programmes.

Not all researchers support the Piagetian Theory as a means towards a theoretical framework. Hammitt (1981) supports the cognitive map theory as the conceptual basis for planning and implementing of interpretative programmes. "Cognitive maps or models are the structure of storage and organization of information a person has about an environment" (Hammitt, 1981, p. 14; see Figure 2). He combines the cognitive map theory with Tilden's principles of interpretation and states that Tilden's principles are the interpreters philosophical framework to the "art of interpretation" (p. 13). The "cognitive map theory [is intended to] provide a basis for understanding how people perceive and think, with how information is taken in and processed, and how familiarity with an environment develops" (p. 13). Thus, cognitive mapping depends on past experiences and how these are related to present and future experiences. The relationship between these experiences is the "pathway of commonality" (p. 14). A distinction between children and adults is in the different amounts of experience possessed by each group . Children are limited in the variety, quantity, and quality of experience they have had and the way children relate to or associate with various stimuli is different from that of adults (Hammitt, 1981). This is not to say that people within their own age group have similar cognitive maps, for no two people experience and interpret similar events or stimuli in the same way. Yet, the understanding that there are some areas of common ground or common experience that can bring together strangers in a group makes it possible for the interpreter to implement a successful interpretative programme.

Another perspective is taken by Iozzi (1989) who examines a teaching-learning process which is holistic, that is, a process that takes into account the affective domain along with the psychomotor and cognitive domain. The affective domain of an individual has as part of its "components" the feelings and emotions of the individual. The affective domain plays as much of a role

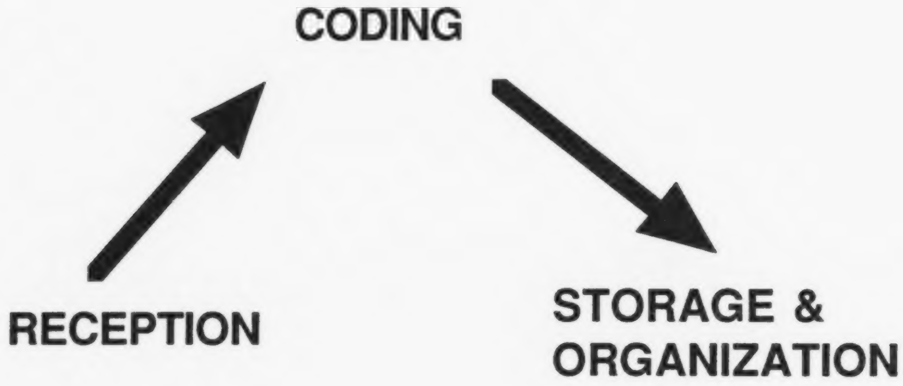
CODING
RECEPTION
STORAGE &
ORGANIZATION

Figure 2. Cognitive Mapping. (C. A. Martynuik, 1992) Information is received by the sensory receptors and coded into simple units which are then stored and organized. Information in the last component is "connected by pathways of commonality". Hammitt, 1981, p. 14.

in the experience and life of the individual as the cognitive domain does, in reality the two domains are inseparable. Therefore, the cognitive processes cannot and do not work without being affected by the feelings, emotions or attitudes of the individual. The sensory input has an effect on the interrelationship and interdependence between the affective, cognitive and psychomotor domains and as a result the individual exhibits a particular overt behaviour (see Figure 3). Iozzi states that Eiss and Harbeck's (1969) model (see Figure 3) "makes clear that the 'gateway' to the learning process is the affective domain" (Iozzi, 1989, p. 3). If this is so and the interpreters focus their messages to touch the affective domain of their visitors then the visitors will take positive action towards the environment (i.e., by not picking wildflowers in designated parks). Thus the result from that message is greater than if only the cognitive domain was focused upon.

Piaget's Theory, cognitive mapping and a holistic teaching-learning model were reviewed as three possible theoretical frameworks for interpreters to use as a basis in their planning and implementing of interpretative programmes for people of all ages especially children. The significance of having and using at least one theoretical framework by interpreters was stressed by all the authors. The authors emphasis was on how their particular framework or conceptual basis would enable the interpreters to develop a better understanding of the visitors and thereby present more interesting programmes.

The Visitor

The importance of knowing the visitor is emphasized in Tilden's (1977) first principle "any interpretation that does not somehow relate what is being displayed or described to something within the personality or experiences of the visitor will be sterile" (p. 9). If what the interpreter says does not in some way connect with the visitor's cognitive and/or "affective domain" then there are no "pathways of commonality", thus the interpreter has not done his or her job. Even if the visitor is present physically he or she may not be present psychologically which can result in the visitor not paying a return visit. A similar message is emphasized by other authors (Machlis & Field, 1974) who reiterate the importance of knowing the visitor. The more information an interpreter has regarding the visitor the greater the chance in the message being received by the visitor (Machlis & Field, 1974).

Figure 3. The Learning Model showing the relationship among the cognitive, affective and psychomotor domains, adapted from Eiss, A. & Harbeck, M. (1969). Behavioral objectives in the affective domain. Washington, DC: National Science Teachers Association, p. 4, has been removed because of copyright restrictions.

Johnson and Field (1984) call the interpreter a "communication specialist" (p. 125). The interpreter's role is more than that of a biologist, geologist, or cultural historian (Johnson & Field, 1984). The interpreter is an educator and as such needs to have some background in the understanding of interpersonal relationships and psychology if he or she is to be successful in communicating the message (Cole, 1984; Iozzi, 1989; Hammitt, 1981; Jensen, 1982; Johnson & Field, 1984).

Sharpe (1976) discusses the visitor under "visitor characteristics" and "visit characteristics". He states that it is the visitor characteristics, such as, age, education, cultural background, interests, and past experiences, which will guide and inform the interpreter as to "the level and content of the [interpretative] message" (Sharpe, 1976, p. 10). Two other visitor characteristics that are becoming more prominent are physical and mental abilities (Bialeschki, 1981). The visit characteristics, as expressed by Sharpe (1976), help the interpreter identify repeat and new visitors, the size of groups, the make-up of the groups, the length of stay and place of origin (home or last place visited) and the visitor's next stop. These and other characteristics enable the interpreter to recognize various visitor attitudes. The information would then be used to plan and implement programmes that would satisfy, engage and motivate the visitor to go beyond what he or she has experienced, and thus prompt them to take some form of action (Brown, 1979; Tilden, 1977).

The literature reviewed strongly supports the belief that without knowing who the visitor is the interpreter may or may not have his or her message received and understood. If the message is received by the participant in the programme then the interpreter has been successful and as a result the visitor may return. Having some background knowledge of the visitor who participates in interpretative programmes allows the interpreter to plan and implement programmes that will stimulate to some form of positive action on the part of the visitor and hopefully a return visit.

The Interpreter

Mullins (1984) identifies three different approaches or roles, each with its own philosophy, that the interpreter could use depending on who the visitor is. The first role is that of a classical naturalist who's concern is with relating nature, as it is observed, to the visitor. The second role is that of an interpretative naturalist who is the communication link between the visitor and the resource being interpreted, while the third role is one of environmental interpreter whose aim is to motivate the visitor to progress one step more and to become involved. Another role mentioned by Mullins is that of a public relations person for the organization or agency for which the interpreter works. Thus, the training of an interpreter goes beyond that which was once acceptable. His or her training should cross-over into other disciplines and philosophies including the realm of scientific research "if the field is to develop to maturity" (p. 5) (Cole, 1984; Johnson & Field, 1984).

Other roles that the interpreter is responsible for have been touched upon to varying degrees throughout this paper. Some of the roles have been mentioned by Edwards (1979) when he discussed interpretation as a service to visitors. These services specify that the interpreter is: a person providing information, a guide, an educator, an entertainer, a persuader and a motivator. Sharpe (1976) supports these six roles and includes manager as the seventh role. Another role that has been discussed as important but not directly identified by any of the authors reviewed so far is that of researcher. As a researcher the interpreter searches for: (1) material for his or her programmes; and (2) information about the visitors who frequent the facilities, utilize the services and/or participate in the programmes. All these roles, including those identified by Mullins (1984) require the interpreter to be an effective communicator.

Summary of Interpretation

It is crucial for the interpreter to develop a programme that is relevant and suited to the children that make up his or her audience. This includes understanding the learning strategies children use to process information. The interpreter also takes on the role of communicator, which unites and gives credence to all the other roles. If the interpreter is not able to effectively communicate then whatever message he or she has to present will not be received by the children who participate in the programme and/or utilize the services

Interpretative Programmes for People who have Disabilities

As a new field of study the literature on interpretation and people with disabilities is sparse and scattered; and that which is published is not always easily attainable. Those services within the museum and natural history interpretative field which are accessible to people with disabilities are either segregated or integrated.

Amid the controversy regarding the merits of segregated versus integrated educational programmes (see Gresham, 1982 for a review) there is support for the stance that both types of programmes are important in the delivery of services to people who have disabilities (Hutchison & Lord, 1982). The following section will look at studies that have been undertaken in the area of segregated and integrated interpretative programmes.

Segregated Interpretative Programmes

One segregated interpretative programme was developed and implemented by Bronsdon Rowan and Rogow (1978) for children in a museum setting who have some degree of vision loss. Bronsdon Rowan and Rogow made the following comments and recommendations about their programme: (1) children should be divided into small groups in order for them to have more personalized attention; (2) a theme should be developed throughout the programme; (3) the use of multi-sensory experiences should be incorporated into the programme but it was important not to overload the children with too many stimuli; (4) "a clear logical sequence" (p. 41) should be developed with regard to the movement of children from one experience to the next; and (5) that the children have "an uninterrupted flow of experiences" (p. 41).

An example of another segregated study was one developed and implemented by Bardt-Pellerin (1981). Bardt-Pellerin's study took place in an art museum with children with severe cerebral palsy. These children were all in wheelchairs and used a Blissymbolics board to communicate. The four factors that Bardt-Pellerin stated as being important for the children to "gain a maximum benefit from each visit" (p. 28) were: (1) the pre-visit to the school; (2) the pre-programme preparation by the teacher prior to each visit; (3) one common theme throughout the whole programme; and (4) having a tangible momento for each child at the end of each visit. An additional factor that should be considered is Bardt-Pellerin's continuous consultation with the teacher prior to and during the visits without which the programme would not have been as successful.

The two papers by Bronsdon Rowan and Rogow (1978) and Bardt-Pellerin (1978) were about specific segregated groups of children, yet there are generalities that are common to all programmes. For example, both authors stated that it was important to have some knowledge of children, to have interactive and engaging activities and positive reinforcement. These same points are important for programmes involving children who have mild developmental disabilities.

Integrated Interpretative Programmes

The integrated interpretative programmes that are discussed in this section exhibit a lot of similarity with those reviewed in the previous section entitled Segregated Interpretative Programmes. The differences between the two types of programmes are more explicit in the last three studies reviewed in this section.

Beechel (1975) and Inglis (1978) have synthesized information on four to five different groups of people with disabilities and directed this knowledge specifically to interpreters. The commonality in their papers was their interest in having interpretative programmes accessible to people with developmental and/or physical disabilities. Beechel (1975) focused her discussion on outdoor natural history interpretative programmes while Inglis (1978) addressed museum educational programmes, yet the information provided by both authors could be used in either the outdoor or indoor interpretative programmes. Beechel (1975) discussed the following five groups of disabilities: blindness, deafness, deaf-blindness, mental retardation and ambulatory limitations. She included in each of these sections facts and misconceptions about the disability. Beechel also included hints to help the interpreter feel comfortable with those who have a disability and information about special facts that need to be considered when planning and implementing programmes. She has also included suggestions as to what persons who have a disability want in an interpretative situation.

Inglis' (1978) article to museum educators is about the planning and implementation of programmes for children who were in the following four groups: developmental disability (mental retardation), physical disability, blind and deaf. She discussed major characteristics of each group and identified for the educator the best planning and teaching techniques that would best suit each group of children. Inglis also identified possible structural problems that may be found in some museums. Among her conclusions Inglis mentioned and elaborated upon the need for training of museum educators if they were to provide programmes for children who have disabilities.

In summary Beechel (1975), and Inglis (1978) stated that knowledge about the visitor, communication with the visitor and having them involved in the programme were necessary for interpretation to be effective. They also mentioned that programmes could be offered in a variety of settings and modifications that were made for people who have some type of disability could benefit everyone.

Schleien, Ray, Soderman-Oslon and McMahon's (1987) study was set in a children's art gallery within a community museum. They researched what the effect of children who have a moderately to severely developmental disability would have on an integrated art education programme. The researchers used an integrated methodology to assist with the social integration of these students into the programme. The methodology or "overall instructional 'package'" (p. 115) included the following: (1) in-service training for all the museum staff, teachers and trainer advocates; (2) a continual support network provided by the first two authors throughout the project; (3) a pre-integration visit by the "special friends", who were children without disabilities, to acquaint them with the facilities and a sensitivity training session; and (4) cooperative groups which had a ratio of four children who do not have a disability to one child who has a disability. These students worked together in their same cooperative group for the whole six months of the study. The cooperative groups were used as a device to help those children who have developmental disabilities to acquire appropriate social skills. These skills were reinforced by the staff, teachers, and observers using positive social reinforcement "to help students maintain groupings and when students were observed interacting appropriately" (p. 115).

Schleien, et al., stated the points following as relevant with regard to interpreting for children who have developmental disabilities: (1) the repeat visits using one common theme throughout the programme; (2) the "sequential units of study" (p. 114) which helped to build and reinforce what had been learned in each previous visit; and (3) the integration methodology

Schleien et al. used in the social integration of children who have a moderate to severe developmental disability.

A study by McAvoy and Schleien (1988) focused on the integration of school children with varying disabilities into natural history interpretative programmes. Five different projects were conducted over a period of about a year with variation in location, in programmes, in programme length and in format. The students were in teams of 12, comprising four students who have disabilities and eight students who did not have disabilities.

The package of strategies that McAvoy and Schleien used in the integration of the students was similar to those used by Schleien, et al., (1987) and included cooperative learning skills, special friends and trainer advocates. McAvoy and Schleien (1988) developed and explained a list of five integration strategies for interpreters. They were the following:

(1) The emphasis of the programme should be on awareness, understanding and appreciation, not the accumulation of facts (p.21).

(2) The interpretative agency and staff must respect the dignity of persons with disabilities and open lines of communication to the disabled community.

(3) A cooperative learning structure is an effective educational method in integrated interpretative programmes.

(4) The non-disabled peers in integrated programmes should receive "special friends" training on how to interact with persons with disabilities (p. 22).

(5) Trainer advocate volunteers are needed to supplement the interpreter by assisting a person with disabilities in the interpretative activity and in facilitating interactions within an interpretative setting (p. 23).

McAvoy and Schleien state that if the above five integrative strategies can be fulfilled along with physical accessibility (facility and programme accessibility) then people with disabilities can be integrated successfully into interpretative programmes.

A third study of a similar focus to the above two found that the children who were not disabled and integrated with children who were severely developmentally disabled showed no significant difference in the information they retained than the control group (who were not disabled), even after two months (Hornfeldt, McAvoy and Schleien, 1989). The same integration strategies that were used by Schleien, et al. (1987) and McAvoy and Schleien (1988) were employed in this study.

Schleien, et al., (1987), McAvoy & Schleien (1988) and Hornfeldt, et al. (1989) discussed integrated interpretative programmes for children. Schleien, et al.'s (1987) study was situated in a museum and focused on an integrated art programme. The studies by McAvoy & Schleien (1988) and Hornfeldt, et al. (1989) were implemented at nature centres and used natural history interpretative programmes as a tool for integration. All three studies used the same strategies, special friends, cooperative learning, trainer advocates and positive reinforcement, as devices to establish social integration. The results of the studies indicate that these strategies work to develop positive attitudes towards peers who have a disability; improve social interaction between both groups of children; and reinforce appropriate behaviour for children with disabilities. The studies also show that children who do not have a disability and are integrated compare equally in their cognitive gain with those of their peers who do not have a disability and were in segregated programmes.

Summary of the Interpretative Programmes for People who have Disabilities

The above studies have indicated that positive attitudes and knowledge by the agency and staff about children with disabilities is an important factor in the provision of accessible services. The acquisition of the information can be through such means as formal in-service training programmes for interpretative staff, one to one interaction where the interpreter observes the children in the classroom, and by working directly with the teacher in the development of a programme.

Teaching Methods and Strategies

The three major topics that have been examined to this point are interwoven in this last section of Chapter Two. These topics have focused on: the development of children who have mild developmental disabilities; interpretation and its many facets; and interpretative programmes for people who have a disability. The knowledge and understanding of the above topics are important components in the development of interpretative programmes for children who have mild developmental disabilities. But in order to implement the programmes interpreters need to have information on the kinds of teaching strategies that would best assist these children in the task of learning. This next section will discuss teaching methods and strategies that are appropriate for children who have mild developmental disabilities.

Roberson (1970a, 1970b) uses two types of teaching methods, closed and opened, as tools for teachers to use as they appraise their own teaching skills. Closed methods include lecture, question, demonstration, direction, mastery and problem solving. Open methods include clarification, inquiry and dialogue (see Appendix I for definitions). These same methods and the various strategies identified by Roberson (1970a, 1970b) with modifications can be used in teaching and instructing children who have mild developmental disabilities. The rest of this section will discuss modifications that should be used when working with these children in a natural history interpretative setting.

An important first step for the interpreter to take is to find out whether or not the information that they will be covering is new to the children that will be participating in the natural history interpretative programme. A phone call to the teacher of the children will provide this information. If the concepts are new to the children then this information should be sent to the classroom teacher who would review it with the children prior to the field trip as part of the pre-visitation preparation.

The interpreter's pre-visitation preparation should include an overview of the research into understanding how best to make their programme exciting and meaningful to their specific clientele. The information that the interpreter acquires should show that children who have mild developmental disabilities are in, or are advancing towards, the concrete thinking stage (Grossman, 1983). As a result any information that the interpreter presents to these children would include concrete concepts as opposed to abstract concepts (Grossman, 1983; Nelson & Cummings, 1981, 1984; Possberg, 1977). Some examples of abstract concepts that children who have mild developmental disabilities have problems with are: after, always, centre, forward, backward, and different (Nelson & Cummings, 1981; 1984).

The format that the interpreter would use in presenting concrete concepts to the children should be repetitive and contain experiences and/or information that are meaningful and familiar to the children (Possberg, 1977). Along with repetitions, children with mild developmental disabilities learn best through the sequential break down of behaviours that are needed to complete a task or activity (Hayes, 1973; Possberg, 1977; Robb, Havens & Witman, 1983; Wehman, 1978, 1979; Wehman, Schleien, & Reynolds, 1981). The progress of the sequence or movement from one task to another ought to move from the simple and less complex behaviour or sub-task to the next one that is more complex (Hayes, 1973). The instructions or directions outlining the task or activity must be demonstrated prior to the children attempting the activity. The next progression can include physical prompts by the teacher and then progress gradually to verbal prompts as the children develop the skill that is being learned (Robb, et. al., 1983). Since these children have poor short-term memory, they need to have the instructions repeated and over-learn the mechanics of the task in order to retain the directions (Das, 1973a; Possberg, 1977). The transition from one skill to another or one activity to another needs to be smooth or else the children will become confused (Hayes, 1973).

Along with task analysis and the need to over-develop a skill, children who have mild developmental disabilities require more learning time than do children who do not have mild developmental disabilities (Hayes, 1973). Appropriate lengths for a learning period has been demonstrated to be between 15 and 25 minutes with recreational breaks in between (Das, 1973b; Possberg, 1977). The more difficult the task the shorter the individual learning period intervals (Das, 1973b) required for mastery.

Another aspect of the interpreter's format presentation is that of theoretical relationships. The emphasis of sensory relationships rather than cognitive relationships would be better understood by the children who have mild developmental disabilities (Robb, et al., 1983). To help in this understanding the interpreter should use visible tactile prompts or props to accentuate his or her verbal presentation (Pasnak, et. al., 1989) and have these items accessible to the children (Cole, 1984). Children who have mild developmental disabilities obtain more from an experience that includes hands-on artifacts and activities (Cole, 1984). The more tactile the hands-on experience or approach is for these children the better they learn. Therefore concrete teaching materials need to be part of the tools used by the interpreter when working with these children. The second most effective approach would be visual with no hands-on activities. The least effective learning situation for these children is that of an auditory presentation by itself (Possberg, 1977), for example when the interpreter presents information by using only a lecture method. The length of the presentation needs to be brief and concise or else the attention of the children will wander (Possberg, 1977).

An important motivational tool, to help keep the children's attention to the task or activity they are doing, is that of reinforcement (Cole & Gardner, 1988; Hayes, 1973; Pasnak, et. al., 1989; Possberg, 1977). External rewards and positive verbal feedback on the successful completion of part or all of a task helps motivate the children to continue on with the task and also to move on to one that is more complex.

Appropriate behaviour is one of the reinforcements that can be used as a motivational tool by the interpreter. When the interpreter talks to the children about what they can and cannot do, this information should be concise and simple and presented a few at a time or else the children will become overwhelmed (Hayes, 1973). The appropriate behaviour of these children should be required from the start (Possberg, 1977) and the issuing of discipline only when it is necessary (Hayes, 1973).

The physical environment that children who have mild developmental disabilities are to learn in can be overwhelming if it is unfamiliar. A physical environment that is as non-descript as possible (Das, 1973b) makes it easier to hold the children's attention, but this is not always possible in a natural history setting. These children do have the same attention span range as children who do not have developmental disabilities when the learning environment is low key (Das, 1973b) and familiar to them (Possberg, 1977). If the children come into an unfamiliar environment then time is needed for them to acquaint themselves with the setting prior to learning a task or activity (Possberg, 1977).

Summary of Teaching Methods and Strategies

The above studies have shown that children who have mild developmental disabilities need to have teaching methods modified to suit their particular needs if they are to benefit from the educational experience.

Conclusion

This literature review has examined four major topics that are important in the understanding of, and in the planning and development of interpretative programmes for children who have developmental disabilities.

These topics are: (1) five developmental areas with respect to children who have developmental disabilities; (2) the various components and elements which interweave with each other to provide the art of interpretation; (3) segregated and integrated interpretative programmes: and (4) modified teaching methods and strategies for use by interpreters. If any of these topics are not understood by the interpreters then good interpretation for children who have developmental disabilities cannot be the end result.

CHAPTER THREE

Research Plan

Introduction

> The problem of this study, stated in Chapter One, is as follows: Do the Experimental In-Service Leadership Training Sessions have an effect on the interpreters in their presentation of interpretative programmes for children who have mild developmental disabilities?

In order to answer the above question this chapter of the thesis will cover the following eight areas (1) definitions; (2) delimitations; (3) the population researched; (4) the programmes involved in the study; (5) the development of the study; (6) the methods used to collect the data; (7) the methods used to analyze the data; and (8) a summary of the chapter.

Definitions of Terms

There are a number of terms which will be consistently employed throughout the study and these are defined as follows:

1) Interpretation - involves interaction with people of all ages, abilities and background through one or more methods of communication (e.g., interpretative nature walks, discussions, films, displays) regarding a subject (includes objects, sites and processes). Some of interpretation's more specific aspects include natural history interpretation, environmental interpretation, and environmental education.

2) Project WILD - "is an interdisciplinary, supplementary environmental and conservation education programme emphasizing wildlife" (Canadian Nature Federation, 1985, p. v). It is an educational workshop for persons (i.e., community leader volunteers, teachers, etc.) who have an interest in working with young people in the areas of conservation and the environment.

3) Mild developmental disabilities -was used throughout the text as being synonymous with the term mild mental retardation. The phrase "developmental disabilities" has replaced the expression "mental

retardation" used by agencies who act as spoke-persons and work with and for people who have developmental disabilities (G. Arias, personal communication, August 8, 1990; W. F. Lockhart, personal communication, September 20, 1990).

4) Children who have mild mental retardation - are children who have an intellectual quotient (IQ) between 50 and 75.5; have a grade level in academic subjects (i. e., reading, mathematics) that is below the acceptable level of achievement and/or have difficulty functioning on a social level within their classroom. This entrance criteria is a combination of what the Sturgeon School Division #24 and the Edmonton Catholic Schools use (O'Neil, 1990; Special Education, April, 1987) and therefore will be the definition for this study.

5) Junior Challenge 1 Program - is a program offered by the Sturgeon School Division #24 . The program "is designed for students who are functioning at an EMH [educable mentally handicapped/mildly mentally retarded] level and experiencing severe delays in academic functioning accompanied by mild to moderate delays in other developmental areas" (O'Neil, 1990, p. 20).

6) Educational Experience Program Level 3 (EE3) - is a program offered by the Edmonton Catholic Schools. The program is designed "to assist in the education of youngsters with moderate, broad based learning difficulties" (Special Education, April, 1987, p. 1).

7) Revised Frequency Count - (RFC) - The end result of the following mathematical procedure: TM/TL X 30 = RFC (the revised frequency count of a teaching method that was used by an interpreter).
The numerator - (TM) - the frequency count of each teaching method used by an interpreter, e.g., Lecture Method - frequency count is 10.
The denominator - (TL) - the length of time, in minutes, that a scripted video tape was used as part of the study, e.g., 20 minutes as the time length of a scripted video.

The above fraction multiplied by 30 minutes - the projected time length that each scripted video tape was to have been analyzed for the study; used as a common unit of analysis to make each raw data from a scripted video tape equal in time length to all the others that were part of the study.
e.g., 10/20 X 30 = 15 RFC for the Lecture Method used by an interpreter during a 30 minute portion of his or her scripted video tape.

8) Primary Level - It is a basic or first teaching method in the development of a topic (theme) or subtopic (subtheme). From the Primary Level teaching method develops the appropriate use of additional teaching methods referred to as the Secondary Level teaching methods.

9) Secondary Level - It is another stage in the development and growth of a topic (theme) or subtopic (subtheme). The teaching method(s) in this level is (are) used to draw forth more of the substance from the topic (theme) or subtopic (subtheme).

Delimitations

The delimitations of this study were specific to the population being studied, the location of the study and the time frame. The following were considered: (1) the education of adults as interpreters; (2) the children with mild developmental disabilities who participated in the study; (3) the sample size; (4) the location of the study and (5) the time frame for the study.

(1) The adults who were the interpreters for this study were participating in a leadership training course which included a Project WILD Workshop and in-service leadership training sessions.

(2) The participating children ranged in age from 9 to 12 years old and came from either the Educational Experience Program Level 3 from within the Edmonton Catholic Schools or the Junior Challenge 1 Program from within the Sturgeon School Division #24. These children have been classified according to intelligence and achievement tests by the school boards as part of their placement policy.

(3) The sample size of 30 children who participated in the study and who have mild developmental disabilities depended on the number of students registered in the Educational Experience Program Level 3 or Junior Challenge 1 Program and on gaining the permission of the parents or guardians to participate in the study. There were approximately 6 to 10 children who have mild developmental disabilities in each of the 4 classrooms within the Edmonton Catholic Schools and the one classroom in Sturgeon School Division #24. All class members were given the opportunity to participate in the study.

The sample size of interpreters was ten. Each interpreter worked with two to five children.

(4) This study was conducted along the Capital City Park Trail between William Hawrelak Park and Emily Murphy Park, Edmonton, Alberta.

(5) The data collection for this study was conducted during the month of March, 1991.

The Population

The two population groups that are important to this study are the adult natural history interpreters and children who have mild developmental disabilities. This section will discuss these two groups.

Interpreters

Fourteen adult interpreters, who were registered in a leadership training programme, participated on a volunteer basis in this study. All fourteen adult interpreters were given Interpreter Questionnaire #1 (see Appendix II) to complete in order for the researcher to obtain information as to their background and experience. The information received from this questionnaire was used to match pair the interpreters prior to their being randomly assigned, with the flip of a coin, to either the experimental or control group. Thus seven interpreters were eligible to take part in each of the control and the experimental portions of the programme.

Only five match paired interpreters were assigned to participate in the actual data collection portion of the study. The other two match paired interpreters were categorized as extras and were assigned to present programmes to those children who were ineligible to participate in the study.

Children who have Mild Developmental Disabilities

The school children used in this study came from four schools in the Edmonton Catholic School District and one school in the Sturgeon School Division #24. These children who have mild developmental disabilities ranged in age from 9 to 12 and came from Educational Experience Program Level 3 (EE3) classrooms (Edmonton Catholic Schools) and a Junior Challenge 1 Program classroom (Sturgeon School Division #24). All five of these classes comprised of the total complement of students registered in the programmes as part of the regular school setting. There were approximately 30-50 total enrollment spaces in the EE3 classrooms and the Junior Challenge 1 Program classrooms. The sample size of children who participated in the study was governed by parental or guardian permission. The actual group sizes in each of the natural history interpretative programmes varied from two to five children. Fifteen children were eligible to participate in the control group and fifteen were eligible in participate in the experimental group. Sixteen of the total complement of children were ineligible to participate in the study.

The researcher had the teachers match pair the children who were most similar in their behaviour and academic abilities. The specific criteria used by each teacher depended upon the degree of similarity since the children were match paired with the peers in their own classroom. The researcher did offer minimal criteria: place the behaviour/cognitive ability of each of the children on a five point scale; or subdivide the behaviour and cognitive ability of each of the children into smaller units (e.g., social studies, mathematics) and place on a five point scale. The teacher then would match pair those children who were most similar in behaviour and academic/cognitive abilities. Once the researcher had this information children were randomly assigned, with the flip of a coin to either the experimental or the control group.

There were a total of 30 children who represented fifteen matched pairs. One half of the matched pair was assigned to the experimental and the other half to the control portion of the study. Those children who were not eligible to be involved in the study still participated in a natural history programme with those interpreters who were categorized as extras.

The reasons for the small ratio of children to each interpreter are three fold, the first one being that articles on interpretative programmes for children who have a disability (Bardt-Pellerin, 1981; Bronsdon Rowan and Rogow, 1978; and Schleien, Ray, Soderman-Oslon and McMahon's, 1987) used and recommended a low ratio of adult to children who have disability. A second reason which supports this procedure as stated by Bronsdon Rowan and Rogow (1978) is that the children should be placed in small groups in order to get more personalized attention. The third reason is that the class sizes, as mentioned in the Delimitations, Chapter Three of this study, are small. There are 6 to 10 children per classroom, plus not all the children in each of the classrooms were eligible to participate in the study. With regard to the Separate School System there were approximately 70 students between the ages of 9 to 12 years who have mild developmental disabilities. Out of this total complement of students approximately half of the children came from the four schools that participated in the study. As for the Sturgeon School Division #24 only two schools had a Junior Challenge programme with a total of approximately 20 children. Thus in both school systems approximately half of the total possible number of students available were invited to participate in the research for this study.

The Programmes

A general recreation leadership training programme was the umbrella course from which volunteers were recruited to participate in the study. This general course was then supplemented by two specialized programmes: Project WILD, and the Experimental and Control In-Service Leadership Training Sessions. It is these two programmes that will be discussed in this section.

Project WILD

Project WILD is defined as "an interdisciplinary, supplementary environmental and conservation education programme emphasizing wildlife" (Canadian Nature Federation, 1985 p. v). It is an educational workshop for those, such as community leaders and school teachers, who have an interest in working with young people in the areas of conservation and the environment.

One important reason that Project WILD was chosen to supplement the in-service leadership training portion of the study was its extensive use by approximately 4,500 educators since its inception in Alberta in 1984. This same Activity Guide is used across Canada. It can be said to have face validity and to be a reliable indicator with regard to its repeated use by educators and thus by the fact that the material in the Activity Guide is evaluated, revised and updated regularly.

A second reason that Project WILD was chosen was because it supplements the existing school curriculum (e.g., social studies, language arts, and science) along with complementing such community programmes as Boy Scouts, and outdoor education camps. Another reason for this choice was that the material in the Activity Guide is organized and designed so that each activity can be used by itself or integrated into an existing school curriculum or extra-curricula course activity, such as Boy Scouts.

The activities in the Project WILD Activity Guide have been indexed or listed eight different ways. These eight types of listings are: table of contents, grade, subject, skill, topic, setting - indoor, outdoor, aquatic activities and alphabetical listing. The sections or topics cover such areas as appreciation and awareness, ecological principles and responsible human actions. Users of this guide find it efficiently set out and therefore conserve time when selecting activities pertinent to the focus they wish to pursue.

It was from the Activity Guide that the researcher chose the three ten minute activities that were then modified. All the interpreters were instructed to use these activities as part of their 50-60 minute natural history interpretative programme. The Activity guide was available to the interpreters as a resource from which to choose the other activities that would complete the additional 20-30 minutes of their programme presentation to the children who have mild developmental disabilities.

Since Project WILD's inception the length of the workshop has been reduced to approximately two hours because the majority of the participants were educators who had a background in the area of teaching methods and techniques (George Diduck, personal communication, October 29, 1990).

A Conservation Education Officer for the Alberta Parks and Wildlife Department was the presenter of the Project WILD Workshop for both the Supervisor of this project and the researcher. They attended a workshop on January 12,1991. Another Conservation Education Officer, was the presenter for the interpreters. They participated in their Workshop on February 25, 1991 with the Supervisor and the researcher in attendance. The Workshop that the interpreters attended ran for approximately on hour and a half.

In-Service Leadership Training Sessions

Two in-service leadership training sessions, one experimental and the other control, were developed and presented as a supplement to Project WILD and the general leadership training programme. The programme content of both in-service leadership training sessions included the following information to both groups of interpreters: characteristics of children; various teaching methods and techniques; the development and preparation of lesson plans for activities that they would present to children; evaluation of the children (e.g., Are they interested or bored with the activity?, Are they cold?); and the disciplining of children (see Appendix III for the In-Service Leadership Training Sessions Outline).

The Experimental In-Service Leadership Training Manual was presented to a select group of experts for evaluation prior to its implementation in this study. The comments of the experts were then incorporated into the Experimental In-Service Leadership Training Programme before it was used with the experimental group of interpreters. More specifically the sessions in the Experimental In-Service Leadership Training Programme focused on the following:

1) the strategies that children who have mild developmental disabilities use to process cognitive information; and
2) the teaching techniques that will allow the interpreters to modify Project WILD activities to better benefit these children.

The Control In-Service Leadership Training Sessions focused on the following:

1) the strategies that children use to process cognitive information; and
2) the teaching techniques that will assist the interpreters in their presentation of Project WILD activities to children.

As part of the programme content all the interpreters were required to form groups of two or three then develop and write out a lesson plan, according to the examples and guidelines (see Appendix IV for examples of lesson plans) that they were given, for an indoor or outdoor activity. Each interpreter was then required to present the activity to peers while being video taped. This exercise was undertaken to acquaint the interpreters with the idea of being video taped and to provide them with positive points on their methods of presenting an activity to the kind of children that they had been given information about. The interpreters were also required to hand in the lesson plan of the activity they had chosen to present to the children for critiquing by either the Supervisor or the researcher depending on the group to which they were assigned.

All fourteen interpreters were also given the lesson plans to three ten minute activities that they were to present to the children with whom they would be working. Each interpreter was then required to develop activities (including the one that was critiqued) to fill the other thirty minutes that they would have with the children.

As part of the in-service leadership training programme all the interpreters were taken down to Emily Murphy Park and were shown the section of the trail that each of them were assigned to for their presentation of the natural history interpretative programme to the children. They were encouraged to spend as much time as possible on their individual section of trail in order to become familiar with it and what it had to offer. They were also provided with information as to who they could contact with regard to obtaining artifacts to supplement the environment for their activities. Each interpreter was also required to generate alternate site lesson plans which would be used if the weather dictated a change of site.

In order for both in-service leadership training sessions to be offered at the same time and on the same days different presenters presided over each session (see Appendix V for the research schedule). The Project Supervisor was the presenter for the Control In-Service Leadership Training Sessions and the researcher was the presenter for the Experimental In-Service Leadership Training Sessions.

The Procedures

The procedures for the study will be discussed in this section of the chapter. The discussion will cover the following time frames: (1) prior to; (2) during; and (3) after the experimental portion of this study (see Appendix V for the Data Collection Schedule).

Prior to the Experimental Portion of this Study

Before the actual study began, the following steps were undertaken:

(1) An application was first submitted to the Ethics Review Committee, Faculty of Physical Education and Recreation for permission to do the study. Once this permission was obtained an application was then submitted to the Cooperative Activities Program, Faculty of Education. This latter application was undertaken in order to be able to seek entry into the Edmonton Area School Systems. After this permission was received letters of information and requests for participation in the study, and consent forms were sent out to the appropriate school authorities, teachers, and guardians of the children. Letters of information and consent forms were also given to students who were involved in a general recreation

leadership training programme. The letters of information contained a description of the study (i.e., purpose, methods of data collection, ethical considerations, etc.). (See Appendix VI.)

(2) Alternative indoor arrangements were made by the researcher in case inclement weather prevented the interpreters from presenting their programme outdoors. The criteria for moving the programme to an alternate indoor site was that the outside ambient temperature plus the wind chill would need to be below minus 15^0 C. The schools criteria for children being out of doors is minus 20^0 C, which includes the wind chill factor.

(3) Arrangements for the use of video equipment on March 11, 13 and 15, 1991 were made by the researcher.

(4) The Project Supervisor and the researcher participated in the same Project WILD Workshop on January 12, 1991. This dual participation provided a base of uniform information and a consistent outlook that assisted them in the implementation of the Experimental and Control In- Service Leadership Training Sessions.

(5) The Experimental In-Service Training Manual was developed by the researcher and evaluated by a select group of experts. These experts came from the area of Educational Psychology and have undertaken research with children who have mild developmental disabilities. It was then modified as per their suggestions.

(6) The Interpreter Questionnaire #1 and #2, was reviewed by jurists and then modified accordingly. The jurists came from the areas of Sociology, in the field of population research; and Educational Psychology.
(See Appendix II and VII, respectively.)

(7) Adults who were currently registered in a recreation leadership training programme were asked to freely volunteer for the study. They were informed as to the general nature of the study, its purpose and that they would be working with children. At the start of the in-service leadership training programme (March 4, 1991) only the experimental group and not the control group of interpreters were told that they would be working with children who have mild developmental disabilities.

(8) Adult students who were enrolled in an audio visual programme, in the Radio and Television Arts Department at the Northern Alberta Institute of

Technology (N.A.I.T.) were asked to volunteer their time as video technicians for the study.

(9) All the children in the study were video taped in their classrooms to familiarize the children with the possible distraction of the video camera and technician while they participated in the actual study. The researcher was able to visit each of the four classrooms in the Edmonton Catholic School System and do the video taping of the children using a wide angle lens. The teacher from the Sturgeon School Division #24 undertook to video tape her children. All the children, from both school divisions, viewed themselves on the video tape after which the tape was erased in order to maintain the anonymity of the children and the teachers. This process took a total of three days.

(10) A pre-visit package was developed by the researcher and sent out to the teachers. This package contained the following information: (a) the date, time and location of the interpretative programme (outdoor site map); (b) the limit to the weather conditions under which the programme would be held outside; (c) an alternate location if the weather was inclement (site map); (d) clothing requirements; (e) snack or lunch suggestions; (f) an outline of the interpretative programme and the role of the school teacher (g) description of criteria for match pairing the children; (h) the three outdoor activities that were to be presented to all the children; and (i) parental consent forms. (See Appendix VIII.)

(11) The teachers match paired the children with regard to academic ability and behaviour. The researcher then assigned the children randomly to the experimental or the control group by the flip of a coin.

(12) The interpreters responded to Interpreter Questionnaire #1 (see Appendix II) before they had attended the Project WILD Workshop, February 25, 1991. The researcher first match paired the interpreters on the basis of the information in the questionnaire and then randomly assigned the interpreters to the experimental (I-E) group or control (I-C) group by the flip of a coin.

A follow-up session to Project WILD took place on February 27, 1991 for all the interpreters. This sessions was presented by the Project Supervisor and focused on modifying and adapting examples of Project WILD activities for an indoors programme should the weather make this a necessity.

(13) The researcher walked the trail that was used by the interpreters and divided it into six sites. Four sites were set aside for use by those interpreters and children who were participating in the study. The other two were used by those children whose parents or guardians gave permission for the children to go on the field trip but not for participating in the study. The sites were randomly assigned to each interpreter by flipping a coin.

(14) Both groups of interpreters were involved in an in-service leadership training programme. The interpreters in the experimental group (I-E) took part in the Experimental In-Service Leadership Training Sessions which were presented by the researcher, and the interpreters in the control group (I-C) in the Control In-Service Leadership Training Sessions which were presented by the Project Supervisor. These sessions were conducted concurrently on March 4, 6 and 8, 1991. (See Appendix V.)

(15) Transportation of the children to and from the site where the interpretative programme was presented was organized by the schools or the researcher, depending on the preference of each teacher.

During the Experimental Portion of this Study

(16) The programme to be presented by the interpreters to the children took place along the Capital City Park Trails, particularly that part of the trail system that goes from William Hawrelak Park to Emily Murphy Park, Edmonton, Alberta. The programmes were presented for three morning on the following days, March 11, 13, and 15, 1991.

(17) Prior to the actual programme taking place: (a) the video technicians arrived and were given the video cameras that they were to use, and to briefly practice with them; (a) the interpreters arrived and were given a list with the names of their children, and that of their video technician, site number, and name of the teacher or teaching assistant who was to accompany the children; and (b) the children arrived and were then divided into their respective groups and introduced to their interpreter. Once the group and the video technicians were ready everyone walked to their allocated site areas. Since the sites were stretched out in a straight line going west, not all the interpreters arrived at their site at the same time. The time of arrival at a site ranged from a couple of seconds to around five minutes depending upon the distance and curiosity of the children.

(18) The ratio of interpreters to children varied from 1:2 to 1:5. This ratio was dependent on the size of the class and on parental or guardian permission. Each class was assigned a specific time and date for their participation in the programme. The specific area of the site allocated to the control and experimental groups differed slightly.

(19) The interpretative programme ran for one hour with three activities being common to both the experimental and control groups. The other thirty minutes of the programme was developed by each interpreter and therefore may have varied from interpreter to interpreter.

Post Experimental Portion of this Study

(20) After the children's interpretative programme was completed all the interpreters were presented with Interpreter Questionnaire #2 (see Appendix VII). This questionnaire provided evaluative information to the researcher about the Experimental and Control In-Service Leadership Training Sessions. It also helped to identify any differences there might have been in the presentation of the programme by the I-E and I-C interpreters to the children who have mild developmental disabilities.

(21) Following the completion of the second questionnaire the I-E and I-C groups attended a debriefing session on March 18, 1991 with regard to their participation in the study. Both I-E and I-C groups also received the Control or Experimental In-Service Leadership Training Sessions that they had not received prior to working with the children (see Appendix V for the schedule). These sessions were run concurrently on the following days, March 25 and 27, 1991.

(22) The researcher undertook specific training to evaluate the video tapes of the interpreters and the children. This was done by analyzing fifteen scripts from video tapes of other teaching situations in order to acquire experience and reliability as an observer. As a control the Project Supervisor analyzed about a third of the practice scripts, comparisons were made and the marking and analysis of the researcher was adjusted.

(23) A note of thanks was expended to the parents/guardians in the information package that was given to them with the request for having their child participate in the study. Letters of thanks went out to the principals and teachers for their participation in the study. A note of thanks to the video technicians was extended to them via a letter to their

instructor who was the person responsible for recruiting them for the study. The interpreters were thanked for their participation in the study at the end of each of their programmes and again collectively during the debriefing session on March 18, 1991. (See Appendix IX.)

(24) The researcher then scripted out and analyzed the video tapes of the natural history programmes that the interpreters presented to the children.

The Methods of Data Collection

There are a great number of different methods in collecting data. The methods of collection range from such procedures as self-administered questionnaires, pure laboratory experimentation, interviewing, participatory or nonparticipatory observations, and the use of equipment such as tape recorders or video equipment. These all are measuring processes which can involve theoretical and empirical forethought (Carmines & Zeller, 1979). With regards to empirical measurements the research community is concerned with the reliability and validity of the measuring processes.

Carmines & Zeller (1979) state that reliability and validity are "matter[s] of degree[s]" (p. 13) and that neither have absolutes, that is they do not have an "all-or-none property" (p. 13). Measurements can not be a 100 percent reliable/valid or 100 percent unreliable or invalid. but can have a certain degree of reliability/validity.

The descriptive nature of this study lends itself to pre-set teaching categories. These categories have been shown, by Roberson (1970a, 1970b), to be reliable and valid indicators in identifying the teaching methods used by educators. These categories, identified as nine teaching methods (see Appendix I), were recorded with the use of a video camera and then transcribed onto a chart (see Appendix X). Along with the video taping and Roberson's observational recording system self-administered questionnaires were also used in the collection of data for this study. These three methods will be discussed in this section of Chapter Three.

Interpreter Questionnaires

One of the methods used to collect data for this study was self-administered interpreter questionnaires.

(1) The first questionnaire asked the interpreters to respond to questions about their past experiences (a) with people in a variety of settings; (b) with children ages 9 to 11 years old; and (c) with people who have disabilities. (See Appendix II.)

(2) The second questionnaire asked the interpreters to (a) evaluate the Experimental or Control In-Service Leadership Training Sessions; and (b) requested feedback on their ability to modify regular programmes to the needs of children who have mild developmental disabilities. (See Appendix VII.)

Video Taping

Using video equipment as a method of data collection has it's pros and cons. One of the necessities required by the researcher in using this method is that of having preselected categories that he or she is going to look at after the taping is completed. Hutt & Hutt (1970) state that without taking such precautions there may be a great temptation "to make the analysis increasingly detailed".(p. 97). Two disadvantages are: (1) that the field of vision of the camera is limited (Harris, 1986); and (2) the decision of the video technician (Kaplan, 1980) may exclude certain actions and/or behaviours that an observer present at the moment would otherwise be able to pick up. Other problems that may arise have to do with the mechanical operations of the camera, such as battery ineffectiveness and noise and voice pick up by the camera microphone (Kaplan, 1980).

Some of the pros to using a video camera in recording behaviour are: the recording is permanent until erased; the recording can be viewed repeatedly (Bailey, 1979; Connolly, 1973; Hutt & Hutt, 1970; Kaplan, 1980); and the recording allows the researcher to view activities that are happening simultaneously which would otherwise be impossible. This latter factor is one of the main reasons for the video taping of the interpreters. There were two to four interpretative programmes going on simultaneously and the researcher would not have been able to evaluate the interpreters in any other way. The use of video technicians solved the problem for the researcher.

Video technicians were used to do the actual video taping of the interpreters as they interacted with the children during the interpretative programme. The primary focus of their video taping was on the interpreter's interaction with the children. The video technicians were instructed to video tape the full 50-60 minute programme that the interpreters presented to the children taking part in the research study.

Observational System

Teacher-Self Appraisal

The descriptions and modifications of techniques that are part of the Teacher-Self Appraisal (TSA) instrument (Roberson, 1970a, 1970b) used by the researcher for this proposed study, are as follows:

(1) The researcher was the observer and evaluated the video tapes of all the interpreters rather than the interpreters doing this procedure as a self evaluation.

(2) The teaching methods identified by Roberson (1970a, 1970b) which includes six closed (lecture, question, demonstration, direction, mastery and problem-solving) and three open (clarification, inquiry and dialogue) methods used for this study (see Appendix I for definitions).

(3) Each of the teaching methods, used by the interpreters during the course of the natural history interpretative programme, was identified and recorded for analysis.

(4) Only those ground rules identified by Roberson (1970a, 1970b) that applied to the teaching methods was used for this study (see Appendix I).

The following techniques were additions to guidelines identified above:

(1) The coding procedure and format consisted of scripting each video taped natural history programme and then identifying the teaching methods used by each interpreter. Only those parts that involved the actual natural history interpretative programme were evaluated and analyzed. Any part of the script that involved administration, organization, discipline, or children's interaction that did not focus specifically on the natural history interpretative programme was not evaluated or included in the analysis. The frequency of each teaching method used by the interpreters was recorded.

(2) Before the coding procedure was finalized the researcher, in consultation with the project supervisor, clarified the definitions of the Teaching Methods that were used from the TSA Observation System (Roberson, 1970a, 1970b) because of some potential for ambiguity among these definitions (see Appendix I).

(3) The coding chart used to transcribe the observations was developed by the researcher (see Appendix X).

Usage of Teaching Methods

Greater Usage. The teaching methods that are grouped under the category for Greater Usage (demonstration, direction, mastery and clarification) were those that children who have mild developmental disabilities would find the most helpful when it came to learning (Hayes, 1973; Pasnak. et al., 1987; Possberg, 1977; Robb, et al., 1987) . These were the methods that were stressed as important to the experimental group of interpreters during their Experimental In-Service Leadership Training Sessions. The definitions of these teaching methods are found in Appendix I. The strategies to be used by the I-E's as part of these teaching methods include: the manipulation of concrete objects (demonstration) (Cole, 1984; Pasnak, et al., 1987); the repeating of instructions and/or directions in concise declarative sentences (direction); the repeating of a subtask or task until the required skill is acquired (mastery) (Hayes, 1973; Pasnak, et al., 1987, Wehman et al., 1981); and providing opportunities for the children to speak without interruption (clarification).

Lesser Usage. In comparison to the category for Greater Usage, discussed above, the teaching methods in the category for Lesser Usage are not necessarily the best methods to use without "support" from the teaching methods listed in the category for Greater Usage. This is because these children are just coming into, or are in, the concrete thinking stage (Grossman, 1983) and they also process information in a different manner than children who do not have mild developmental disabilities (Das, 1972, 1973a, 1973b, 1973c, 1983, 1985a, 1985b) and therefore have difficulty processing abstract concepts, ideas, and/or information that are unfamiliar to them.

The teaching methods grouped in this category, Lesser Usage, are lecture, question and problem-solving (see Appendix I for definitions). These three teaching methods are quite often used on their own without support from those teaching methods in the category for Greater Usage. Using the lecture method by itself, that is a verbal presentation without the use of any visual aids, would not keep the children's attention for very long (Possberg, 1977). Questions and problem-solving tasks can become very abstract which children who have mild developmental disabilities would have a hard time comprehending. Therefore, these teaching methods should be used least with the children involved in the study.

Equal Usage. The teaching methods in this category are inquiry and dialogue (see Appendix I for definitions). With the inquiry method the teacher is prompting the children to think of what they are saying by questioning their responses, and to also have the children ask the interpreter questions. As for dialogue the children are encouraged to talk amongst themselves with regard to the theme of their programme with some feedback from the interpreter. These teaching methods were classified together as it was expected they would be employed approximately the same amount of time by both groups of interpreters. Educators in any field working with any group of children would encourage and challenge them at their level of cognitive ability.

The Analysis of Data

This field experiment was of a descriptive nature and it consisted of observing a small population of natural history interpreters as they presented a programme to children who have mild developmental disabilities. The relationship observed was between the I-E and I-C group of interpreters. The reference to individuals in this study was done through the use of code names to preserve their integrity and anonymity.

In order to answer the stated problem in Chapter One, this study was designed to identify whether there was a difference in the frequency with which nine teaching methods were used by the I-C and I-E group of interpreters in their presentation of activities to children who have mild developmental disabilities. The premise was that: (1) the I-E group of interpreters would use the Greater Usage group of teaching methods, namely demonstration, direction, mastery and clarification, more frequently than the I-C group; (2) the I-C group of interpreters would use the Lesser Usage group of teaching methods, namely lecture, question and problem-solving, more often than the I-E group; and (3) that the last two teaching methods, inquiry and dialogue, would be used about the same amount by both groups of interpreters, thus identified as Equal Usage. It was expected that this change in usage of teaching methods was because of the difference in knowledge that each group would have about the children they were working with.

Paired one-tailed *t*-tests were only undertaken for the results from the video tape scripts. It was expected that the low numbers of interpreters used in this study may not allow for statistical analysis of the data. Therefore the data was also to be analyzed using written summaries, tables, and scattergrams with visual assessment.

Interpreter Questionnaires

The Interpreter Questionnaire #1 (see Appendix II for a summary of the results) and the first section of the Interpreter Questionnaire #2 (see Appendix VII for a summary of the results) were not used directly as part of the results of this study since they were used for the following: (1) to match pair the interpreters prior to them being randomly assigned to the experimental or control groups; (2) to evaluate the Control and Experimental In-Service Leadership Training Sessions; and (3) to make modifications to the Experimental In-Service Leadership Training Session.

All the questions in Section two of the Interpreter Questionnaire #2 were summarized, according to I-C and I-E interpreter groups, since an open-ended format was used.

Video Tape Analysis

With regard to ethical consideration only the researcher would have access to the video tapes in their original form. Thus the identification of each interpreter and child was held confidential and anonymous by giving each person a code name.

The researcher would script only that part of the recorded programme that showed the group involved in an activity which may or may not include the group walking the trail, identifying objects, sites, and/or animals. The scripting process would also include the coded identification of each person who spoke.

The next step, once the audio of each video tape was scripted, would be to (1) review it for errors, and (2) identify and divide it into sections. The first section would contain administration or organizational factors, such as discipline, given by the interpreter, teacher, or the teaching aid. Included in this would be interjections by anyone other than the interpreter, such as the video technician, teacher, teaching aid or bus driver. The next section would include interjections by the children which did not focus upon or was related to an activity or topic that was part of the programme. The last section would focus only on the presentation of information and the conversations between the interpreter and the children, and between the children and their peers. This information and/or conversations would be centred on the natural history interpretative programme. This latter section would be the one analyzed for thesis study by the researcher.

The process of analysis for the scripted natural history interpretative programmes would include the identification of nine teaching methods at two different levels. The Primary Level (see Chapter Three, Definitions of Terms) would identify the essence and introductory teaching method that each interpreter would use for a topic or subtopic. The Secondary Level (see Chapter Three, Definitions of Terms) would be more explicit, each subsequent sentence would be analyzed and identified as to the method each interpreter used.

After the identification of the Primary and Secondary Level teaching methods, each teaching method per level would then be summed and totaled. The next step would be to identify each script with its appropriate code number so that experimental and control data could be separated. Each of the video tapes would then be timed for their exact length according to the scripted sections. Since there is a possibility that each video tape script would be of a different time length thirty minutes would be used by the researcher as a common unit of analysis. This would allow the researcher to compare the results of the scripts between the control and experimental group of interpreters. Thus the following procedure (see Chapter Three, Definition of Terms) would be undertaken for each script at both the Primary and Secondary Level teaching methods (see Figure 4):

(1) The frequency of each teaching method would be the numerator and would be identified as TM.

(2) The time length of each scripted video tape would be the denominator and would be identified as TL.

(3) This fraction, TM/TL would then be multiplied by the common unit for all scripts - that of 30 minutes.

(4) The result of this mathematical procedure would be called the revised frequency count (RFC) per teaching method.

$$\frac{TM}{TL} \quad X \quad 30 \text{ minutes} = R\ F\ C$$

Figure 4. Revised Frequency Count Formula (C. A. Martynuik, 1992)
The procedure used to give the data obtained from the scripted video tape results a common unit of analysis.
T M - the frequency of each teaching method used by an interpreter; T L - the length of time for each scripted video tape used in the study; 30 minutes as the projected length of time for all the scripted video tapes; and R F C - the revised frequency count for each teaching method that was used by an interpreter.

The next step in the process of analysis would be to combine the RFC of each teaching method per interpreter into the following categories: Greater Usage - demonstration, direction, mastery and clarification; Lesser Usage - lecture, question problem-solving; and Equal Usage - inquiry and dialogue. For computer statistical analysis the revised data would be entered as real numbers for using paired one-tailed *t*-tests. Thus:

(1) The *t*-test is used to find out whether there is a significant difference between two means (Isaac & Michael, 1971; Kerlinger, 1979). The two means to be analyzed in this study would be the comparisons made between the I-C's and I-E's results of the RFC for each of the grouped teaching methods.

(2) The paired *t*-test method would be used because the interpreters were match paired and a comparison would be wanted to identify if there was any difference in means between the two groups.

(3) The one-tailed test would be chosen because a premise was stated as to which teaching methods would be used more frequently, less often or equally by the control and experimental groups of interpreters.

Because of the small sample size the revised frequency counts for each of the teaching methods would be displayed using scattergrams.

Summary

In this chapter the researcher discussed the design of the study which included information about: (1) commonly used terms; (2) the external limits of the study; (3) the population, that is, the interpreters and children who have mild developmental disabilities; (4) the following programmes - general recreation leadership course, Project WILD and the in-service leadership training sessions; (5) the procedures used to complete the study; (4) the instruments used to collect the data; and (6) the means by which the data were to be analyzed.

CHAPTER FOUR

Results and Discussion

Introduction

In this chapter the following topics will be discussed in relation to the data results collected for this study. These topics are: (1) the actual populations that participated in the study; (2) the interpretative programme presented to children who have mild developmental disabilities; (3) the results and discussion of the study's data; and (5) a summary of the chapter.

The Population

The two population groups that are important to this study are adult natural history interpreters and children who have mild developmental disabilities. This section will discuss these two groups.

Interpreters

The final number of interpreters who participated in the study were six or three sets of match pairs. The reasons for the decrease in number are: (1) on day one, March 11, 1991, of the data collection one experimental interpreter (I-E) phoned in sick and therefore, was replaced by an interpreter from the control group (I-C) who was scheduled as an extra; and (2) the video tape recording of another I-E on March 15, 1991, the last day of the interpreter programme presentation, was not of adequate duration and therefore, not included as part of the data base. As a result, these two I-E's not being included in the study, and because each interpreter was match paired, their correspondingly matched interpreter was also excluded from the data results. The three sets of match paired interpreters used in this study were identified as follows: I-C-1 and I-E-1; I-C-2 and I-E-2; I-C-3 and I-E-3.

Children who have Mild Developmental Disabilities

As a consequence of the reduction in the number of match paired interpreters who participated in the study, the number of children and schools involved was also reduced. Of the 30 children and five schools, four from the Edmonton Catholic School System and one in the Sturgeon School Division #24 who took part in the programme, only 15 children and three schools actually participated in the study. All three of these schools came from within the Edmonton Catholic School System.

The Interpretative Programme

The actual recorded lengths of the interpretative programmes ranged from 25 to 60 minutes and did not necessarily contain any or all of the three ten minute activities that each interpreter was required to present to the children. The reasons for the reduction in time of recorded interpretative programmes was: (1) the ineffectiveness of the video camera batteries due to cold weather; (2) the early arrival of some of the school children; and (3) the unfamiliarity of the video cameras by some of the video technicians. To add to the above reasons the interpreters, when asked about their presentation of the activities, mentioned that they did not follow the outline of their lesson plans and, therefore, did not necessarily: (1) do the activities in the order outlined; (2) do the activities as designed, that is, they combined and mixed activities together; and/or (3) did not do one or more of the activities requested by the researcher.

As discussed in Chapter Three, Video Tape Analysis, after the video tapes were scripted they were then analyzed as to the interpreters employment of each of the nine teaching methods at the Primary and Secondary Levels. The results of the usage of the nine teaching methods, per Level and script, were then put into the Revised Frequency Count Formula, Figure 4. Thus, making each video taped script, used in the study, 30 minutes in length.

The Results and Discusion of the Data Collection

Interpreter Questionnaire #2

Section I of the Interpreter Questionnaire was used to evaluate the Experimental In-Service Leadership Training Sessions. As Section I is not directly related to the results of the study the responses will not be included in this chapter. In Section II of the questionnaire each interpreter was asked to respond to the questions with specific reference to the three activities that were common to each interpreter's programme presentation. The three activities were: "Learning to Look, looking to See"; Wildlife is Everywhere"; and "Everybody Needs a Home". Each of the activities was to have taken ten minutes, thereby, giving each interpreter thirty minutes of their own choice of activities in order to fill up the hour long programme. (See Appendix VII for Interpreter Questionnaire #2.)

The questions in Section II, starting with question 13, were in an open-ended format, thus the results were presented in a written summarized form.

Question thirteen, the first question in Section II, was divided into three components. Each component was identified by one of the following indicators (1) "children's body language" and/or (2) "attention to the activity/task", and/or (3) "verbal response". Each interpreter was asked to select the indicator[s] he or she used to judge whether the children understood what was being said to them.

In the first component of question 13 all three control group interpreters responded to and checked off the indicator, "children's body language". The following are the comments that the control group interpreters wrote with regard to the children's body language being used as an indicator: I-C-1 said "I feel they understood what I was talking about but seemed bored by it"; I-C-2 stated "when they walked away I know they were bored"; and I-C-3 used the children's verbal response- "yes/no [and their] facial expressions" to judge each child's level of understanding. From the experimental group two of the three interpreters check marked this indicator. The comments that experimental group interpreters made with regard to this are as follows: the children touched, described and located things, such as tracks; and the children would acknowledge and comply with the request that was asked of them.

For the second component of question 13 only one of the three control group interpreters made a comment and check marked the indicator, "the children's attention to the activity/task". One interpreter from this group made the following comment: when the children's focus was on the interpreter or task it was felt that the children were attentive. Two of the experimental group interpreters check marked and made comments with regard to using the this indicator. The comments that were made were as follows: when the children complied with the interpreter's instructions; and when the children were not paying attention, the interpreter changed the activity. Even though I-E-2 did not check this indicator she commented that the children exhibited a very limited span of focus on the task or activity.

In the third component of question 13 all three control group interpreters marked off and made comments about the last indicator, "children's verbal response". The interpreters comments were as follows: when the interpreter received the responses that she was wanted; if the children gave a relevant response then the interpreter felt sure that the children were headed in the correct direction; and when the children "... said yes/no" I-C-3 felt that they understood the question asked of them. With regard to the results from the experimental group of interpreters only two check marked this indicator but all three made comments. The comments were as follows: when the children replied to the question; when the right answers were given to the questions; and I-E-3 stated that when the children "saw many types of wildlife & [sic] pointed them out" the interpreters felt that the children understood the questions asked of them.

Overall, in question 13, approximately the same number of experimental and control group of interpreters used the three indicators as a means of identifying when the children comprehended what was being said to them. The comments by the experimental group of interpreters were more positive and descriptive about the children's behaviour compared to those made by the control group of interpreters. Two of the I-C's mentioned the children being bored. No interpreter in the experimental group had described the behaviour of the children in this negative way. The I-E's would have known what to expect from the children because of the information they had received during their Experimental In-Service Leadership Training Sessions which were different from that of the I-C's (see Chapter Three, In-Service Leadership Training Sessions).

Question 14 was laid out in the same format as question 13. That is, it was divided into three components. Each component was identified by one of the following indicators (1) "children's body language"; (2) "attention to the activity/task", and/or (3) "lack of verbal response". Each interpreter was asked to select the indicator[s] he or she used to judge if the children did **not** understand what was being said to them.

For the first component two out of three control group interpreters check marked the first indicator, "children's body language", but only one made a comment. The comment made by I-C-3 was that their "facial expressions were very bitter" and this told her that the children did not understand what she was telling them. With regard to the experimental group interpreters' response to this first indicator no one check marked it but I-E-1 made the following comment: " ...lack of attention, facial expression " helped her decide that the children did not understand what she was telling them.

In the second component, of question 14, the indicator was the "children's attention to the activity or task". Two of the three control group interpreters check marked this indicator but only one made the following comment; I-C-1 said "I don't think it was that they didn't understand but that they were bored/edgy". I-E-2 of the experimental group interpreters responded to this part of question 14 by writing a comment but she did not place a check mark. Her comment was that the children had a "limited attention span".

The third component of question 14, was the "children's lack of verbal response". This indicator was check marked by one of the three control group interpreters but no comment was made. Only one of the experimental group interpreters check marked this indicator and stated that if the children did not respond to the question she restated the question into an easier one. A second interpreter who did not check mark this indicator commented that the children "understood most of ..." what she asked them.

The comments made by the experimental group of interpreters for question 14 showed that they had a better understanding of the children than did the control group of interpreters. For example, the control group of interpreters perceived the children to be uninterested, while the experimental group of interpreters understood that the children's span of focus was shorter than those of their peers. Therefore, the I-E's understanding of children who have mild developmental disabilities would have come as a result of having participated in the Experimental In-Service Leadership Training Sessions that provided them with information about these children.

Questions 15 to 19 focused on the children's understanding of concepts and vocabulary, and on the type of feedback that each interpreter gave the children. These five questions asked each interpreter to rate his or her answer on a scale of one to five and then explain the choice that was made (see Table 1 for the tabulated results).

Table 1

Responses[a] to Questions 15 to 19, 21 and 22; Interpreter Questionnaire # 2, Section II

Question Number[b]	SCALE 1				3				5	Group[c]
15	Did Not								Did	
					2			1		C
	1						2			E
16	Did Not								Did	
					2			1		C
							3			E
17	−								+	
				1			2			C
							3			E
18	−								+	
						1	2			C
							3			E
19	−								+	
						1	2			C
							3			E
21	−								+	
		1	1				1			C
	1		1				1			E
22	Did Not								Did	
	2								1	C
									3	E

---

[a] The response scores are raw data which are located in the scale for each question. 1 = response of one person; 2 = response of two people; & 3 = response of three people.

[b] See Appendix VI for individual questions.

[c] C = responses from the control group interpreters; E = responses from the experimental group interpreters.

- responses are negative; + responses are positive.

Question 15 asked each interpreter to identify how well he or she felt the children understood the concepts that were taught. The scale ranged from one, cited as "Did Not Understand the Concepts at all", to five which was "Understood the Concepts Very Well.". (See Table 1 for the tabulated results.)

The control group interpreters' responses ranged from three to four point five. Two out of the three interpreters in this group marked three on the scale which is half way between the "Did Not Understand" and the "Understood the Concepts Very Well". These interpreters did not explain their responses. I-C-1 marked four point five and commented that her children "seemed to 'get' everything" that she taught them. The response from two of the experimental group interpreters was a four and neither provided an explanation for their marks. I-E-2 marked the scale at number two and stated the following: "the time of the session was limited to develop a high understanding" [sic] and, therefore, the children did not have a good understanding of what she was teaching them.

In comparing the experimental with the control group of interpreters' responses to question 15 the I-E's overall (2:1) felt that the children had a good comprehension of the concepts that were being covered. The majority of the I-C's (2:1) perceived that the children were not understanding everything. One of the strategies that the I-E's were told about, to help these children understand, was to keep the concepts as concrete and familiar as possible. As the I-C's were not necessarily aware of the above mentioned strategy the way they presented the concepts to the children may have been more abstract. Though one of the I-E's did comment that she felt that the children did not have a large enough span of time to really understand what was being taught to them. Whereas one of the I-C's stated that she felt that the children were comprehending quite well all of the concepts that she had taught them. The comment made by the interpreter from the experimental group reflects her understanding of the manner and process in which children who have mild developmental disabilities learn. That is, these children are slower and need more time to comprehend new concepts than their peers who do not have mild developmental disabilities.

Question 16 asked each interpreter the question "How well do you feel the children understood the vocabulary you were using in your instruction of activities?" The scale ranged from one which was "Did Not Understand the

Vocabulary at all" to five which was "Understood the Vocabulary Very Well". (See Table 1 for the tabulated results.)

The responses given by the control group interpreters, for question 16, ranged from three to four point five. Two interpreters from the control group marked the scale at three, but did not comment on their response. I-C-1 marked four point five and said that the children "never seem confused" by the vocabulary that she used. All three of the experimental group interpreters marked the scale at four with no explanation given for the rating they chose.

All members of the experimental group of interpreters felt that the children comprehended most of the words and terms that were being used; whereas most of the control group perceived that the children did not understand a good portion of the vocabulary. The vocabulary comprehension of children who have mild developmental disabilities is not as expansive or as easily acquired in comparison to their peers. This is because children who have mild developmental disabilities are limited when it comes to abstract ideas and in the use of descriptive terms. The above information was discussed with the I-E's during their Experimental In-Service Leadership Training Sessions. Therefore, it would have been familiar to them and enable them to use or modify terms as perceived necessary. The I-C's would not have received such information and would not necessarily have been selective in their choice of vocabulary or ability to modify terms on the spur on the moment.

The types of feedback, negative or positive, that each interpreter gave to the children with regard to their affective behaviour, "cognitive ability" and "psychomotor ability" were the focus of questions 17 to 19, respectively. The 17th question asked each interpreter to identify the type of feedback he or she gave to the children with regard to the children's affective behaviour. The scale ranged from one which was "All Negative " to five which was marked as "All Positive". (See Table 1 for the tabulated results.)

The rating given by the control group interpreters ranged from two point five to four. I-C-1 marked the scale at two point five and said the "kids were hyper and anoyed [sic] me". The other two control group interpreters rated the type of feedback they gave the children at four. Neither interpreter made any comments. All three of the experimental group interpreters marked the scale at four with no explanation given for the rating they chose.

Each interpreter was asked in question 18 to rate the type of feedback he or she gave with regard to "The verbal response of the children's cognitive ability ...". The scale ranged from one which was "All Negative " to five which was marked as "All Positive". (See Table 1 for the tabulated results.)

The ratings given by the control group interpreters, for question 18, ranged from three point five to four. The lowest rating, three point five was given by I-C-1 who stated that the children "usually gave me the answer I was looking for". The other two interpreters gave ratings of four and neither provided an explanation for their response to this question. A scale rating of four was given by all three of the experimental group interpreters and only one of them made a comment. I-E-1 said that the children had an "excellent understanding" and, therefore, the majority of the feedback she gave them was positive.

Question 19 asked each interpreter to respond to the following: "Demonstration of the children's psychomotor ability prompted me to give ______ feedback". The scale range from one which was "All Negative " to five which was marked as "All Positive". (See Table 1 for the tabulated results.)

The control group interpreters markings on the scale, for question 19, ranged from three point five to four. I-C-1 marked the scale at three point five and made no comment as to the mark she gave. The other two interpreters from this group all marked the scale at four but made no comment. All three of the experimental group interpreters marked the scale at four with no explanation for their choice.

For all three of the questions, 17, 18 and 19, the experimental group of interpreters rated the feedback they gave the children as being more positive than that of the control group of interpreters. The fore knowledge that the I-E's had about children who have mild developmental disabilities would have helped them prepare for the children's behaviour and cognitive and psychomotor abilities. Thus, the experimental group of interpreters would have a more positive perception of the behaviour of these children.

Question 20 asked each interpreter for a free will written response to this question. Each interpreter was to specify the indicators that he or she used to judge if the children needed more time to understand what was being taught to them.

Two of the control group interpreters answered question 20. Their statements were as follows: I-C-1 said "if they gave a response which was wrong (totally) I would re-word [sic] the question"; while I-C-2 indicated that he modified his teaching only "if they showed any kind of non-understanding". All three of the experimental group interpreters answered this question. Their comments were as follows: I-E-1 said that the children had a "good understanding of language [therefore there was] no further language breakdown."; I-E-2 indicated that the children " ... were restless and would need a longer session with more energetic activities"; while I-E-3 said that the childrens' "lack of response" was what was used to identify the childrens' need for more time to understand what was being taught them. The experimental group of interpreters gave more specific indicators than the control group of interpreters. The experimental group of interpreters, having received information about children who have mild developmental disabilities, would have been looking for indicators which would have told them how receptive the children were to the information and directions being given to them, while the control group of interpreters were not prepared, through training, to identify anything specific.

Question 21 asked each interpreter the following question "Did the children you worked with need more time to understand what you were teaching them?" The scale at one was "No Additional Time " and at five it was marked as "Much More Additional Time". (See Table 1 for the tabulated results.)

The responses given by the control group interpreters, for question 21, ranged from one point two-five to four. I-C-1 marked the scale at one point two-five and stated that "I could have done the activity in twenty-five minutes". I-C-2 marked the scale at two and did not comment. I-C-3 marked the scale at four and did not comment on his response. The range of responses from the experimental group interpreters went from one to four and none of them explained their responses to the question. The ratings for both groups were very similar, but with a slight lean in favour of the experimental group of interpreters who felt very little extra time was needed by the children to comprehend what they were being taught. Two of the interpreters from each group felt that the children did not need or require very much extra time. Both of the other interpreters from each group felt that the children did require more time to understand what he or she was teaching them. The two I-C's that did not perceive that more time was needed had experience with children in recreational settings. This was not so with the experimental group of interpreters. Only one of the interpreters with previous experience working with children responded in the same way as that of the two I-C's. Overall there does not seem to be a lot of difference between the two groups with regard to this question since no one from either group made any comments to support their scale response.

Question 22 asked each interpreter to identify if the children's behaviour was what he or she had expected. For this question each interpreter had a choice of two responses and he or she was to select one of them. The first choice was "Did NOT Expect" and the second choice was "Did Expect". (See Table 1 for the tabulated results.)

With the control group, two interpreters said that the children's behaviour was not what they expected and one interpreter said that it was, but did not comment. Of those that said the children's behaviour was not what they expected they stated the following: I-C-1 said that she "was not told that these kids were 'special' " and I-C-2 indicated that the children " ... were passive and ... felt [they] did not care wether [sic] they were here or not". All three of the experimental group interpreters identified the children's behaviour as what they had expected. Only E-2 wrote a comment and said that she " ... felt their [sic] however would [sic] be a longer attention span" than what they did have. The behaviour of children who have mild developmental disabilities was discussed in the I-E's Experimental In-Service Leadership Training Sessions but not in the sessions attended by the I-C's. Thus, the I-E's should have and did know what type of behaviour to expect from the children with whom they were working. One of the I-C's stated that she was not told about the children having a mild developmental disability which was correct.

Question 23 expected voluntarily answered and consisted of two components. The first component asked each interpreter to identify if they did or did not "change or modify any part of the programme after ... ". To this first component each interpreter was also asked to provide an explanation for his or her answer. The second component to question 23 was with respect to the feedback they received from the children.

For the first component of question 23 all three of the control group interpreters answered this question in the affirmative. Only one of the control group interpreters did not write a comment. The comments from the other two interpreters were as follows: I-C-1 said that "Yes, made it much less structured. The children were hyper and really would not follow a totally structured program" while I-C-2 indicated "Yes - Big Time. They were disinterested & [sic] passive". All three of the experimental group interpreters wrote that they did change or modify the programme after they had started their presentation. Their comments were as follows: I-E-1 stated "Yes. Answered questions and responded great [sic]"; I-E-2 said "Yes, I generalize [sic] things. I tried to follow their leads to keep their interest."; while I-E-3 said that "it was expected." that she would have to adjust her programme.

The second component of question 23 asked each interpreter to identify the type of feedback that he or she received from the children that lead to changing or modifying the programme. The following comments come from the control group interpreters: I-C-1 indicated that the children " ... were wrestling, (play) fighting in the bush"; while I-C-3 stated that it was because "the [sic] seemed to be very bored w/ [sic] what we were doing therefore there was really no structure in the progrne [sic]" that led them to adjust their programmes. All of the experimental group interpreters wrote comments. The interpreters wrote the following: I-E-1 indicated that the children liked "the trails - use of sight very interesting - they really love to observe things ... "; I-E-2 stated that the children " ... were not focusing on me"; while I-E-3 felt that it was the children's " ... understanding" which led each one to adjust their own programmes.

With regard to question 23, the type of comments made by the experimental group of interpreters were more positive and one said that the need to adjust her programme did not come as a surprise. The control group gave negative responses with regard to their perception of the feedback coming from the children. Such as, the children "play fighting" (I-C-1), or being "hyper" (I-C-1), "bored" (I-C-3), or "passive" (I-C-2). With the experimental group of interpreters having knowledge about the possible behaviour of children who have mild developmental disabilities it is not surprising that their perception is more positive then the control group. The experimental group of interpreters were informed during their Experimental In-Service Leadership Training Sessions that a new and unfamiliar environment for children who have mild developmental disabilities would probably cause them to "misbehave", for example, become hyperactive or passive.

Question 24 focused on the three common activities that all interpreters, control and experimental, were to include in their 60 minutes of programming. These activities were: "Learning to Look, Looking to See"; "Wildlife is Everywhere"; and "Everybody Needs a Home". The activities were listed separately in the questionnaire, but because of similarities between them they were dealt with as one response. Question 24 asked each interpreter the following: "In teaching the 3 activities put a check mark against each of the standard terms you used. If you modified the Vocabulary indicate the change that you made." There were in all 28 terms with space for the interpreters to add additional terms.

Table 2 shows that the I-C group of interpreters used more of the terms that were listed than the I-E group of interpreters, that is 23 to 14 respectively. It was noted, therefore, that there was an opposite trend in the number of terms each group had modified. The I-C group had modified 11 while the I-E group changed 13 terms. (See Appendix VII for the raw data summary.) During the Experimental In-Service Leadership Training Sessions the I-E's were cautioned about the use of words such as those found in the "standard terms'" list. The I-E's were informed that those terms would probably be difficult for children who have mild developmental disabilities to comprehend. It was suggested to the I-E's that they replace the "standard terms" with words that were more concrete and familiar to the children participating in their programme.

Question 25 asked for each interpreter to state any other modifications he or she made as part of his or her entire programme of 60 minutes.

Interpreters from both groups stated that they had made some kind of modification to their programme. I-C-1 said that she stopped using her cards and took her group of children on a walk which everyone found "more enjoyable". She said that she also used droppings [scats]. I-C-2 said that he loosely followed his lesson plans and spent the time "working with the kids in a [sic] unorganized fashion relative to the planned programme". I-C-3 indicated that she "improvised because they really didn't seem interested especially near the end". The following comments were made by the I-E group of interpreters: I-E-1 said that she had changed her programme plans, she intermingled the activities because of the site and the way the children responded "towards things"; I-E-2 stated that she tried to do more walking with the children because they were energetic; and I-E-3 indicated that she "used first names, pointed to things, [and] clarified things" as other modifications to her programme.

Table 2

Results from Question #24 [a], Interpreter Questionnaire #2, Section II.

Group	Number of Terms Used[b]	Number of Terms Changed[b]
Control	23	11
Experimental	14	13

[a] Question # 24 - "In teaching the 3 activities put a check mark against each of the standard terms you used. If you modified the Vocabulary indicate the change that you made."

[b] The total counts for both columns only recognized the first time a term was used. That is, if two interpreters used or changed the same term only one usage was recognized. See Appendix.VI.for the raw data usage of each term.

The responses, for question 25, that came from the experimental group of interpreters were more positive as compared to those made by the control group of interpreters. The I-E's stated that the modifications they made were in response to the children's behaviour and therefore they: intermixed activities, walked more because the children were full of energy; and "clarified things" (I-E-3). While the I-C's comments were more negative, that is, one of them described the changes he made as being "unorganized" (I-C-2) and the children were not "interested" in the programme (I-C-3). The I-C's identified the need to change but did not seem to have a very positive feeling about the children nor were they prepared to be flexible about the need to modify their programmes. The I-E's on the other hand were knowledgeable about the children. The I-E's were aware of various possible behaviours that the children may exhibit and the type of teaching strategies that would help make the programme more enjoyable and appropriate for the children. This knowledge came from the Experimental In-Service leadership Training Sessions that they attended.

The last question, number 26, also indicated that the focus of the question was on the three activities common to each interpreter. These activities were: "Learning to Look, Looking to See"; "Wildlife is Everywhere"; and "Everybody Needs a Home". Question twenty-six asked each interpreter the following: "How did you PERCEIVE, as a percent (%), the amount of time you used the following methods?" for each of the three required activities. The "methods" refer to the nine teaching methods that were discussed in greater detail in Chapter Three and in Appendix X. The average for each of the nine teaching methods from all three activities, from each group, were added together. For example, for the lecture methods the average for: I-E-1 was 10; I-E-2 was 10; and I-E-3 was 5. Each of these averages were then added together (10 + 10 + 5 = 25) and divided by three (25/3 = 8.33) to give an approximate average perceived usage. This was done for each of the teaching methods for both the experimental and control groups of interpreters.

The teaching methods were then grouped as follows: Greater - demonstration, direction, mastery-drill, and clarification; Lesser - lecture, question, and problem-solving; and Equal - inquiry and dialogue. These groupings correspond to the premise stated in Chapter Three, that is, the teaching methods that would be used the most (Greater Usage) and least (Lesser Usage) by the experimental as compared to the control group of interpreters.

And those teaching methods that would be used about equally (Equal Usage) by both groups of interpreters.

Table 3 is the tabulation of question 26 and shows that the perceived usage of both groups, control and experimental, resembled the premise of this study, as stated above. Under the category for Greater Usage: the teaching method demonstration was perceived to have been used approximately five times more by the experimental than the control group of interpreters. The teaching methods direction and mastery were perceived to have been used slightly more often by the control than the experimental group interpreters; 10% compared to 7%; and 1% compared to 0%, respectively. While the teaching method clarification was perceived to have been used six times more often by the experimental than the control group. That is, the I-E perceived that they did use the teaching methods identified for Greater Usage more often than the I-C group, 41% to 17% respectively.

Under the category for Lesser Usage: the teaching method lecture was used slightly more frequently by the experimental than the control group interpreters, 8% compared to 5%, respectively. While the teaching method questioning was perceived to have been used about three times more often by the control than the experimental group of interpreters. The last teaching method in this group is problem-solving and the control group perceived themselves as having used it 3% of the time compared to the experimental group of interpreters who felt they did not use it at all. Those teaching methods grouped for Lesser Usage had a perceived usage by the I-C group of 67% as compared to the I-E's 35%.

For those grouped in the category for Equal Usage the Experimental group perceived themselves as having used the teaching method inquiry three times more often than that of the control group interpreters. Whereas with the teaching method dialogue, both groups perceived their usage to be about the same. Thus, the teaching methods identified for Equal Usage were perceived to have been used 24% by the I-E group and 17% by the I-C group of interpreters. The difference between the I-E's and I-C's percent usage of this last group of teaching methods, Equal Usage, is less than that of the other two groupings, Greater and Lesser Usage.

The results, recorded on Table 3, supported the premise stated in Chapter Three. The premise said that the I-E's would use the teaching methods categorized as: (1) Greater Usage more frequently then the I-C's; (2) Lesser

Table 3

Responses from Question #26[a], Interpreter Questionnaire #2, SectionII.

Teaching Methods	Control - % Mean[b]	% Total[d]	Experimental - % Mean[c]	% Total[d]
Greater Usage				
Demonstration	4		22	
Direction	10	17	7	41
Mastery	1		0	
Clarification	2		12	
Lesser Usage				
Lecture	5		8	
Question	60	67	27	35
Problem-Solving	3			
Equal Usage				
Inquiry	4	17	12	24
Dialogue	13		12	
% Total [d]	101	101	100	100

[a] Question #26 - "How did you PERCEIVE, as a percent (%), the amount of time you used the following teaching methods. (The final % should equal 100%.)"

[b] Control - % Total for each teaching methods grouping: Greater Usage - demonstration, direction, mastery, & clarification; Lesser Usage - lecture, question, & problem-solving; and Equal Usage - inquiry & dialogue.

[c] Experimental - % Total for each teaching methods grouping: Greater Usage - demonstration, direction, mastery, & clarification; Lesser Usage - lecture, question, & problem-solving; and Equal Usage - inquiry & dialogue.

[d] The % Mean and the % Total have all been rounded off and therefore do not necessarily total 100%.

Usage less often then the I-C's; and (3) Equal Usage - about the some number of times as the I-C's. The Experimental In-Service Leadership Training Sessions that the I-E's participated in, provided information as to teaching methods that were most beneficial to children who have mild developmental disabilities. As a result of this In-Service the experimental group of interpreters felt that they had used more of the Greater Usage teaching methods than the control group of interpreters. Therefore, it would have been expected that the experimental group would employ the teaching methods in the category of Lesser Usage less often and those in the category of Equal Usage the same number of times as the control group of interpreters.

Summary

Throughout the Interpreter Questionnaire # 2, Section II the experimental group of interpreters' comments were very positive with regard to their perception of the children and the programme that they presented. One of the experimental group of interpreters stated throughout the questionnaire that she felt the children had a good comprehension of the vocabulary she was using. Even the interpreter, in the experimental group, who had very little experience with children provided very positive comments about their behaviour and indicated that what took place during the programme was not unexpected. Whereas the members of the control group of interpreters were not very positive about the children's behaviour. From the information gleaned from the questionnaire the control group of interpreters seemed to feel that things were not going very well with their "organized" programme and with the children. Even though all three of them made modifications to their programmes they did not indicate that the desired results were produced.

Video Tape Analysis

The video tapes of the interpreters presenting natural history interpretative programmes to children who have mild developmental disabilities were scripted and then analyzed. Each script was analyzed to identify Primary and Secondary Level teaching methods (see Chapter Three for Definitions of Terms). Within each level nine teaching methods were identified and then categorized as follows: Greater Usage - demonstration, direction, mastery and clarification; Lesser Usage - lecture, question and problem-solving; and Equal Usage - inquiry and dialogue. As described in Chapter Three (The Analysis of Data, Video Tape Analysis) the raw scores for each teaching method used by all six interpreters were adjusted to allow for comparisons between sets of match paired interpreters and between the control and experimental group interpreters. This adjusted score is referred to as the revised frequency count (RFC). (See Chapter Three for Definitions of Terms.)

t-test

The *t*-tests shown in Tables 4 and 5 are the results of the video analysis for the scripted portions of video tapes of interpreters presenting programmes to children who have mild developmental disabilities. Each table shows the *t*-test results of usage by all six interpreters for the three categories of teaching methods (Greater, Lesser, and Equal Usage). The paired one-tailed *t*-tests results in both tables did not, overall, indicate any agreement with the premise stated above and in Chapter Three.

Primary Level. Table 4 shows the results of the paired one-tailed *t*-test for Primary Level teaching methods. The *t* -values for the teaching methods categorized for Greater and Lesser Usage were -1.9E-2 and -0.4, respectively and were lower than the probability values which were .4935 and .353, respectively. Thus, no significant differences, between the control and experimental group of interpreters, were shown with regard to the teaching methods categorized for Greater and Lesser Usage. Therefore, the statistical results do not support the premise of the study which stated that there would be a difference between the control and experimental groups usage of these two categories. A possible reason for the no significant difference result in the employment of teaching methods in the above mentioned categories was that the researcher, as the presenter of the Experimental In-Service Leadership Training Sessions, may not have emphasized strongly enough those teaching methods which were of greater benefit to the children who have mild developmental disabilities. The I-E's may not have connected the information on the learning strategies of children who have mild developmental disabilities with the various teaching methods that would facilitate the children learning and, thereby, did not consciously or unconsciously use the more appropriate category of teaching methods. The

Table 4

Paired One - tailed *t* - test of the Video Tape Results of the Interpretative Programmes - Primary Level Teaching Methods

Category[a]	Mean X - Y:[b]	Paired t value:	Prob. (1-tail):
Greater Usage	-0.4	-1.9E-2	.4935
Lesser Usage	-3.4	-0.4	.353
Equal Usage	-0.7	-7.5	.0087

[a] *t* - test of the video tape results comparing the control (X) and the experimental (Y) group of interpreters with regard to the Primary Level teaching methods that are categorized as:

(1) Greater Usage (demonstration, direction, mastery and clarification)
(2) Lesser Usage (lecture, question and problem-solving)
(3) Equal Usage (inquiry and dialogue)

[b] df = 2

I-E's may not have exerted any extra effort into incorporating into their lesson plan the teaching methods categorized for Greater Usage. Without conscious effort to incorporate these teaching methods the I-E's may then have fallen back on those teaching methods that they use with the general population. Thus, no significant difference was shown between the control and experimental group of interpreters.

The results in the table for those teaching methods categorized under Equal Usage do not show a significant difference between the control and experimental group of interpreters. The *t* -value was -7.5 and the probability value, .0087. This does support the premise of the study stated which was, that both the control and experimental groups would use these teaching methods approximately the same number of times. A possible reason for this may be because these methods were employed considerably less frequently than the other two usage groups. Thus, the minimal discrepancy in the use of the teaching methods in the category for Equal Usage may be the result of the low number of interpreters participating in the study. Another possibility is that the interpreters may be too inexperienced as leaders to be able to guide the children using the teaching methods in the category for Equal Usage. (See Appendix X for the table showing the Revised Frequency Counts for the Primary Level teaching methods categorized for Greater, Lesser and Equal Usage).

Secondary Level. Table 5 illustrates the results of the paired one-tailed *t*-tests for Secondary Level teaching methods. The results in Table 5 for the teaching methods in the first two categories for Greater and Lesser Usage were similar to those in Table 4 for the Primary Level teaching methods. The *t* -values were: -0.7 and -0.1, for Greater and Lesser Usage, respectively. The probability values were: .2886 and .4475, for Greater and Lesser Usage, respectively. There was no significant difference between the control and experimental group interpreters employment of the categories for Greater and Lesser Usage teaching methods at the Secondary Level. The possible reasons that were previously given with regard to the employment of Primary Level teaching methods may also extend into the Secondary Level teaching methods categories.

The *t*-test does show a significant difference between the I-C's and the I-E's employment of the categories for Equal Usage, which is contrary to the premise of this study. The *t* -value is 1.3 and the probability value is .1635 for

Table 5

Paired One - tailed *t* - test of the Video Tape Results of the Interpretative Programmes - Secondary Level Teaching Methods

Category[a]	Mean X - Y:[b]	Paired t value:	Prob. (1-tail):
Greater Usage	-10.7	-0.7	.2886
Lesser Usage	-13.6	-0.1	.4475
Equal Usage	31.9	1.3	.1635

[a] *t* - test of the video tape results comparing the control (X) and the experimental (Y) group of interpreters with regard to the Secondary Level teaching methods that are categorized as:

(1) Greater Usage (demonstration, direction, mastery and clarification).

(2) Lesser Usage (lecture, question and problem-solving)

(3) Equal Usage (inquiry and dialogue)

[b] df = 2

the teaching methods in the category of Equal Usage. The premise stated that this category of Equal Usage would be employed about the same number of times by both groups of interpreters. As a Secondary Level the teaching methods subsumed in the category for Equal Usage may be part of the teaching "style" of the I-C's, while the I-E's were made more aware of the usefulness of other teaching methods for the children used in the study. The I-C's may feel more comfortable using these teaching methods than the I-E's, that is, the I-C's may set up the teaching situation which encourages and supports the use of this category of teaching methods more frequently than the I-E's.
(See Appendix X for the Revised Frequency Counts for the Secondary Level teaching methods categorized for Greater, Lesser and Equal Usage).

Scattergram Results

The data extracted from the video tapes were also visually analyzed using scattergrams. The scattergrams in Figures 5 to 8 show the results of the utilization of Primary Level teaching methods, while Figures 9 to 11 show the results of the employment of Secondary Level teaching methods. All of the results of the scattergrams are based on the revised frequency count (see Chapter Three) generated by each interpreter from both the control and experimental groups. Factors that may have an effect on the overall results of the video tape data will be presented at the end of this section. (See Appendix X for the Revised Frequency Counts of the Primary and Secondary Level Teaching Methods.)

Primary Level. Figure 5 shows an overview of the results of the Primary Level teaching methods in the form of a scattergram for all three categories, Greater, Lesser and Equal Usage. It should be noted that the teaching methods in the category for Lesser Usage were not used as frequently as those in the category for Greater Usage but were used more often than those in the category for Equal Usage.

The teaching methods in the category of Greater Usage, as seen in Figure 5, were employed more often by both groups of interpreters than the other two categories, Lesser and Equal Usage. The revised frequency counts of both groups of interpreters for the teaching methods categorized under Greater Usage were distributed along the vertical axis without any real separation between them. This lack of clustering, with regard to one group of interpreters employing this teaching method more than the other, does not

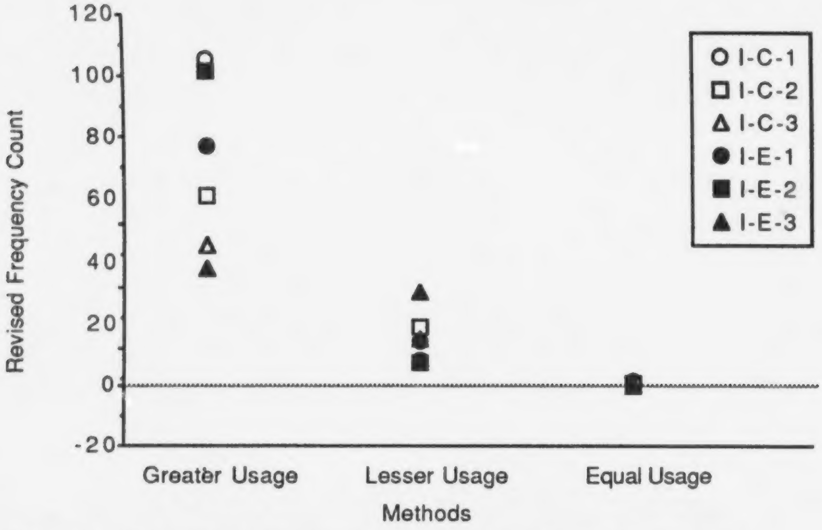

Figure 5. The revised frequency count results of the Primary Level teaching methods for each of the six interpreters.
Greater Usage - demonstration, direction, mastery and clarification;
Lesser Usage - lecture, question and problem-solving; and
Equal Usage - inquiry and dialogue.

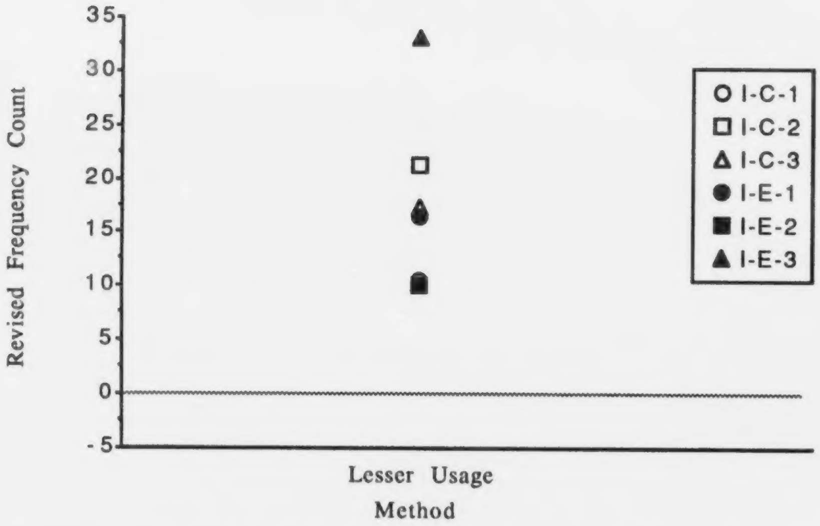

Figure 6. The revised frequency count results of the Primary Level teaching methods for each of the six interpreters.
Lesser Usage - lecture, question and problem-solving.

support the premise stated above. The following are possible causal factors for the ceiling effect which resulted in a lack of premise support for the teaching methods in the category of Greater Usage:

(1) The situation may be that both the control and experimental group of interpreters had more experience with a variety of children, including those with disabilities, than they had indicated in Interpreter Questionnaire #1. This omission may have occurred because the interpreters thought that some of their experience(s) were not significant enough to record in the Interpreter Questionnaire #1 or they may not have recalled them at the time of completing the Questionnaire. This omitted information could have influenced the results of the study.

(2) It may be that the teaching methods that the I-C's had practiced as part of their repertoire were appropriate for the children who have mild developmental disabilities even though they were not informed about the children included in this study. Therefore, the control group of interpreters, by accident, used the recommended teaching methods. The I-E's were given information on the best learning strategies and methods for children who have mild developmental disabilities as part of the Experimental In-Service Leadership Training Sessions. As stated in the premise, the I-E's were expected to have used the teaching methods in the category for Greater Usage more than the I-C group of interpreters.

(3) It may be that the I-C's were very observant of the children's responses and thus, quickly came to an understanding as to which teaching methods worked even though they had not been trained to recognize and respond to such cues.

Interpreters I-C-3 and I-E-3 (Figure 5) used the teaching methods in the category for Greater Usage the least number of times compared to the other two sets of matched pairs. Interpreters I-C-3 and I-E-3 were also the only matched pair situated close to each other in this scattergram, whereas the other matched pairs were further apart. A possible influence for this type of distribution may have been that I-C-3 and I-E-3 were the only two interpreters who had little or no experience with children in a recreational and/or institutional setting. In contrast to this latter matched pair the other interpreters had worked with children in some type of recreational or institutional setting. With I-C-3's and I-E-3's lack of experience working with children they may not have developed a repertoire of strategies such as, demonstrating a whole activity then breaking the activity down into smaller learning units. The fore mentioned strategy and others could be utilized, with the teaching methods identified in the category for Greater Usage, while teaching those who have mild developmental disabilities.

Each of the interpreters' revised frequency counts are tightly clustered together in Figure 5 for the teaching methods comprising the category for Lesser Usage. Thus, Figure 6 illustrates a wider distribution along the vertical axis of the revised frequency counts for each member of both groups for the category of Lesser Usage. Within this group of teaching methods the distribution of the I-C's and the I-E's are intermixed, thus, no separation of the two groups of interpreters is present. Yet a difference is seen in the visual representation of the data for this category of usage. This difference is caused by I-E-3 having a higher revised frequency count then the other five interpreters. A factor that may have helped to influence this distribution is that I-E-3 did not list any type of experience with children or adults, whereas I-C-3 did have some experience with children in an institutional setting but had no experience with adults. This lack of experience may have contributed to I-E-3's inability to read the children's responses and then employ the appropriate teaching methods pertaining to the situation.

Figure 5 displays the I-C's and I-E's usage of the teaching methods in the category for Equal Usage as being very close together, thereby, visually confirming the statistical result, of the paired one-tail *t*-test, in Table 4 showed that there was no significant difference between the two groups of interpreters. This is in agreement with the premise stated above, that is, both groups of interpreters would employ the teaching methods in the category for Equal Usage about the same number of times. This figure, Figure 5, also shows that the teaching methods in this category of Equal Usage were used the least number of times, by each interpreter, compared to the usage for the other two categories. The tight cluster of revised frequency counts, for the teaching methods in the category for Equal Usage, also prevents the individual identification of the interpreters. In Figure 7 a wider distribution of each interpreters' revised frequency count, for the category of Equal Usage, is illustrated along the vertical axis of the scattergram. When looking along this axis the range in the numbers is very small. Yet it does show that I-E-3 exhibits the highest revised frequency count of all the interpreters. The next highest in the category for Equal Usage is a cluster with I-C-1 and I-E-3, with

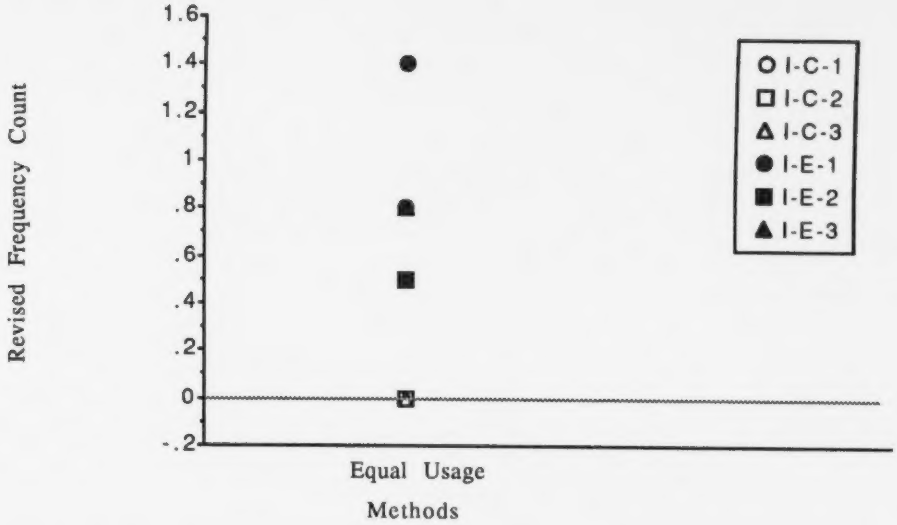

Figure 7. The revised frequency count results of the Primary Level teaching methods for each of the six interpreters.
Equal Usage - inquiry and dialogue.

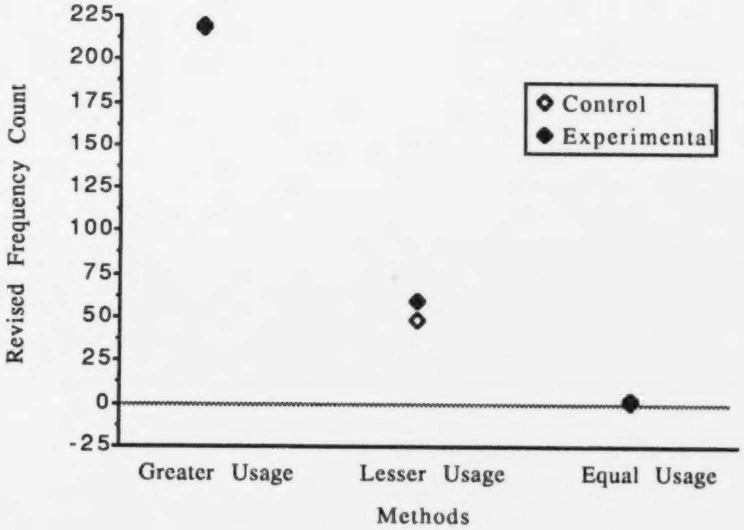

Figure 8. The totalled revised frequency count results of the experimental and control group interpreters for the Primary Level teaching methods .
Greater Usage - demonstration, direction, mastery and clarification;
Lesser Usage - lecture, question and problem-solving; and
Equal Usage - inquiry and dialogue.

I-E-2 exhibiting a slightly lower revised frequency count. The last two interpreters, I-C-2 and I-C-3 are shown not to have employed any of the teaching methods in the category for Equal Usage. Therefore, with the results from Table 4, paired one-tailed *t*-test, and the low employment of the teaching methods in the category for Equal Usage the premise that was stated is supported. That is, both groups of interpreters used the teaching methods in the category for Equal Usage approximately the same number of times.

All three categories for the Primary Level teaching methods are illustrated in Figure 8. The I-C's and I-E's revised frequency counts in this scattergram have been summed and totalled to provide only one score for each interpreter grouping. The visual presentation of two of the teaching methods in the categories, namely Greater and Equal Usage, support the results from Table 4, the paired one-tailed *t*-test. That is, the I-C's and the I-E's employment of the teaching methods comprising the categories for Greater and Equal Usage show no difference from each other. The teaching methods in the category for Lesser Usage in Figure 8 shows that the I-E's have used this grouping slightly more often than the I-C's, but not necessarily significantly so. The I-E's employment of the teaching methods in the categories for Greater and Lesser Usage also showed no support for the premise. The premise being that the teaching methods in the two latter categories would be used by the experimental group of interpreters more frequently and less often, respectively, than by the control group.

Factors that may have influenced the results of the study, particularly for the interpreters utilization of the teaching methods comprising the categories of Greater and Lesser Usage, were: (1) that the experimental group of interpreters did not have enough in-service training time in order to change their teaching behaviour; and or (2) this same group of interpreters may not have consciously worked at changing their regular teaching behaviour to one which would have been more suitable when working with children who have mild developmental disabilities. Thus, their "regular" teaching style was similar to the type employed by the interpreters in the control group. (3) The control group of interpreters were adept at reading the children and, therefore, "instinctively" changed their teaching style to better suite their clientele.

Secondary Level. Figures 9 to 11 represent the results of the Secondary Level teaching methods which are grouped together in the three categories of

Greater, Lesser and Equal Usage. Figures 9 and 10 illustrate the revised frequency counts (RFC) for each member, while Figure 11 shows the same results totalled for both groups, for the above mentioned categories. It should be noted that the teaching methods comprising the category of Lesser Usage were employed the most by both groups of interpreters as compared to the other two categories, namely Greater and Equal Usage.

All three categories, Greater, Lesser and Equal Usage, are illustrated in Figure 9. The majority of the interpreters' revised frequency counts, identified for the teaching methods subsumed in category of Greater Usage, are tightly clustered together in Figure 9. Thus, Figure 10 illustrates a wider distribution, for each of the members of both groups of interpreters, along the vertical axis of the revised frequency counts for the above category of teaching methods. This wider distribution gives a visual impression that the I-E's have used this category more often than the I-C's. The premise that the I-E's would use this category more frequently than the I-C's holds true even if the difference between the revised frequency counts is not significant.

A similarity between Figures 5 (Primary Level teaching methods) and 10 (Secondary Level teaching methods) is in the arrangement on the revised frequency count scale of I-C-3 and I-E-3 as compared to the other interpreters. Both I-C-3's and I-E-3's revised frequency counts for the category of Greater Usage are the lowest for each of their groups. As stated previously both I-E-3 and I-C-3 indicated that they had little or no experience working with children. Therefore, their lack of knowledge about children and teaching strategies and methods may have been a causal factor in their low utilization of the teaching methods that comprise the category of Greater Usage. What is dissimilar between the two figures is that I-C-3 has the lower RFC in Figure 10 but the higher one in Figure 5. The difference in preference, between I-C-3 and I-E-3, with regard to the Primary (Figure 5) and Secondary (Figure 10) Level, for using the teaching methods in this category at one level over another may or may not be important. In adding together the revised frequency counts for both levels, for each interpreter, the summed total is close to being the same The definitions of what is a Primary and Secondary Level teaching method was a strategy developed in order to analyze the video tape data and not information that either group of interpreters had received. Thus, at what Level, any interpreter utilizes the teaching methods in a particular category, may not be important. (see Appendix X for the Revised

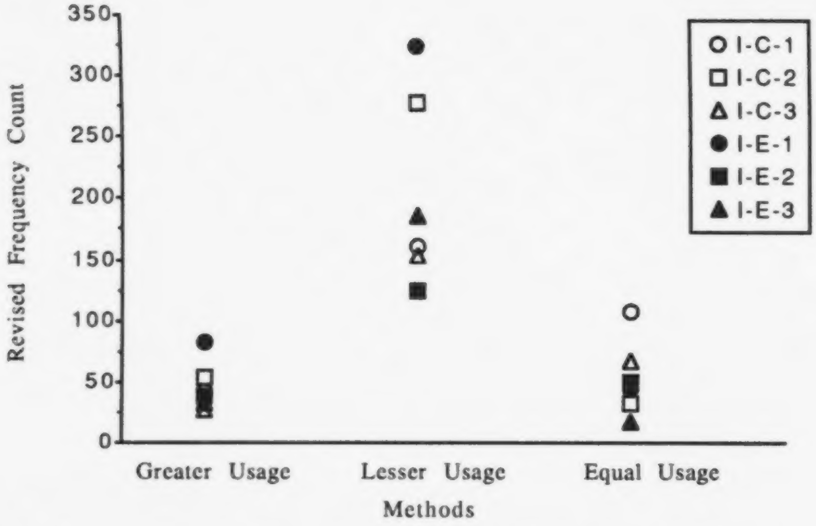

Figure 9. The revised frequency count results of the Secondary Level teaching methods for each of the six interpreters.

Greater Usage - demonstration, direction, mastery and clarification; Lesser Usage - lecture, question and problem-solving; and Equal Usage - inquiry and dialogue.

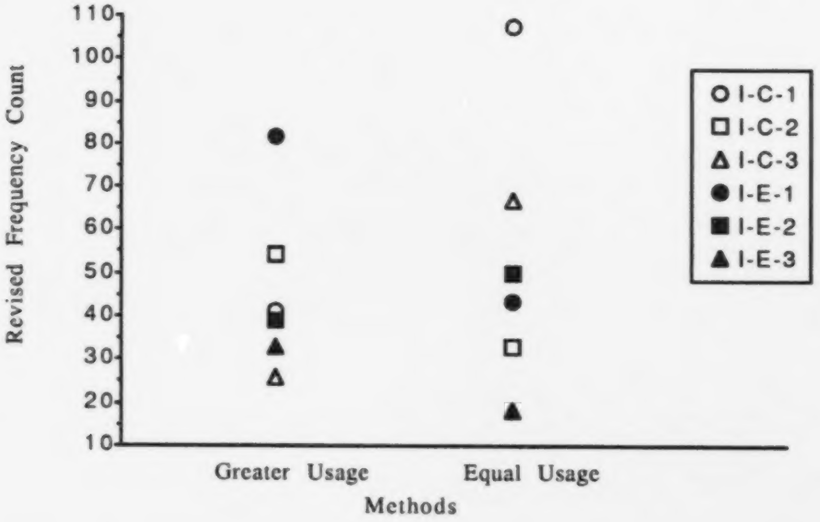

Figure 10. The revised frequency count results of the Secondary Level teaching methods for each of the six interpreters.

Greater Usage - demonstration, direction, mastery and clarification; and Equal Usage - inquiry and dialogue.

Frequency Counts for the Primary and Secondary Level teaching methods for all six interpreters).

Another note to be made is that the revised frequency count in Figure 5 for these two match paired interpreters, I-C-3 and I-E-3, is higher than in Figure 10. The only two interpreters who have maintained a close revised frequency count in both the Primary Level (Figure 5) and the Secondary Level (Figure 10) teaching methods for this same category, namely Greater Usage, are I-C-2 and I-E-1. As stated above the Level (Primary and/or Secondary) of employment of teaching methods per category is an arbitrary decision on the part of the researcher. Yet, there may be a preference for the utilization of one level over another, this point will be discussed in the last part of this section.

The Secondary Level teaching methods in the category for Lesser Usage is illustrated in Figure 9. At a glance the visual impression is that the experimental group of interpreters employed the teaching methods in this category slightly more often than the control group. With this being so then the premise previously stated is not supported. That is, the experimental group of interpreters should have utilized the teaching methods in the category for Lesser Usage less frequently than the control group. In particular it is I-E-1 who has the highest revised frequency count of all the other five interpreters. Thus, I-E-1 brings the revised frequency count total for the experimental group of interpreters above that of the control group. Out of all six interpreters, I-E-1 was the only one who had identified, in Interpreter Questionnaire #1, having worked with children who have a moderate developmental disability. Even with this previous work experience and then her subsequent participation in the Experimental In-Service Leadership Training Sessions I-E-1 still employed the teaching methods in the category for Lesser Usage more frequently than any of the other interpreters. She had also utilized this category approximately four times that of the recommended teaching methods in the category for Greater Usage. A possibility is that a lack of enough time for practice and opportunity for individual feedback on teaching method presentation, during the Experimental In-Service Leadership Training Sessions, prevented I-E-1 and the other two I-E's, who were participating in these sessions, to adapt and modify their style of presentation. This would be especially important for I-E-1, because of her past involvement with children who have developmental disabilities, as she would require more time in order for her to change old teaching habits.

An interesting configuration is noted with regard to I-C-2's and I-E-1's placement in relation to each other. Both share the uppermost cluster in Figures 9 (Lesser Usage) and 10 (Greater Usage). There is no observable reason why I-C-2 and I-E-1 are where they are as compared to their matched pairs.

In Figure 9 all six interpreters who employed the teaching methods in the category for Equal Usage are illustrated as a fairly close grouping. An improved view of the placement of each interpreter, along the vertical axis, is illustrated in Figure 10. The teaching methods in the category for Equal Usage, as displayed in Figure 10, indicate that the I-C's have used this category more often than the I-E's which is the opposite of what Figure 6, at the Primary Level, illustrates. This visual representation of the teaching methods in the category for Equal Usage then agrees with the paired one-tailed *t*-test results in Table 5. The results in Table 5 shows a significant difference between the I-C's and the I-E's usage of the teaching methods in this category. The result, in Figure 10, does not support the premise which stated that both groups of interpreters would employ the teaching methods in the category for Equal Usage approximately the same amount. Plausible causal factors for the premise not being supported: (1) is that the I-C's were more comfortable in using the teaching methods in this category, namely Equal Usage, than the I-E's; and (2) that the I-C's may have more experience in using these methods with children than the I-E's.

Another situation to note in Figure 10, for the teaching methods in the category for Equal Usage, at the Secondary Level, is that two of the I-C's (I-C-1 and I-C-3) employed these methods more often than any of the other interpreters. In Figure 7, for the teaching methods in the category for Equal Usage, at the Primary Level, two of the I-C's (I-C-2 and I-C-3) did not use any of the methods. The only I-C that is common to both results is I-C-3 who had very little experience working with children. Possible reasons for the outcome: (1) the division between Primary and Secondary Level teaching methods was the perogative of the researcher and therefore, the interpreters would not have been aware of any type of separation; and (2) a personal, conscious and unconscious, learning from past schooling may effect the teaching style of the interpreters, thereby, causing them to use certain methods more than others.

The last figure in this chapter is Figure 11 and it indicates the sum total usage of the teaching methods of all three categories, Greater, Lesser and Equal Usage, for the I-C's and the I-E's, at the Secondary Level. The I-E's revised frequency counts in Figure 11 for the the teaching methods comprising the categories of Greater and Lesser Usage are slightly higher than the I-C's but not necessarily significantly different. Even with no significant difference between the two groups of interpreters, for the teaching methods in the category for Greater Usage, the premise would still be supported. That is, that the experimental group of interpreters would use the teaching methods in the category for Greater Usage more often than the control group. A larger sample size, of interpreters, may lend credence to the premise stated above. With a larger sample size there may have been a greater chance of a wider discrepancy between the control and experimental group of interpreters usage of the teaching methods comprising the category of Greater Usage. But with the teaching methods in the category for Lesser Usage the premise was not supported. Thus, the experimental group, instead of the control group, of interpreters utilized the teaching methods in this category more frequently. The premise was also not supported for the teaching methods in the category for Equal Usage. The revised frequency counts for the I-C's was greater than for the I-E's. Possible causal factors for the nonsupport of the premise for the teaching methods comprising the categories of Lesser and Equal Usage have been previously discussed. The stated factors were presented as assumptions and, thus, require further research.

An interesting comparison can be made between Figures 8, at the Primary Level, and 11, at the Secondary Level, with respect to the overall usage of each category of teaching methods by both groups of interpreters. In the Primary Level teaching methods the highest revised frequency count is the category of Greater Usage. The category of Lesser Usage is next in line, and the category for Equal Usage has the lowest revised frequency count. Within the Secondary Level teaching methods the highest revised frequency count in the category of Lesser Usage, while the category for Greater Usage has the lowest revised frequency count. Those teaching methods in the category for Equal Usage have a slightly higher revised frequency count than those in the

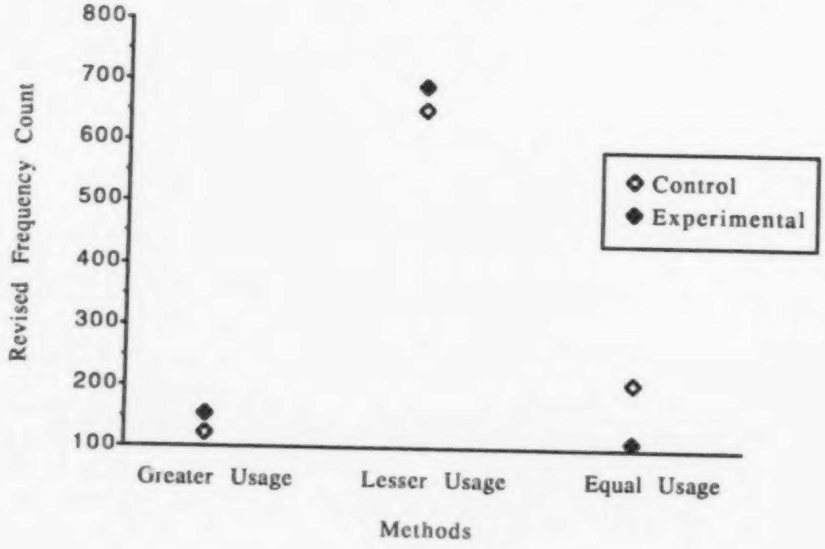

Figure 11. The totalled revised frequency count results of the experimental and control group interpreters for the Secondary Level teaching methods.

Greater Usage - demonstration, direction, mastery and clarification;
Lesser Usage - lecture, question and problem-solving; and
Equal Usage - inquiry and dialogue.

category for Greater Usage. (See Chapter Three for Primary and Secondary Level definitions) A possible explanation for the "reverse" or "opposite" configuration in the usage of the teaching methods may be that the category for Greater Usage at the Primary Level was more often elaborated on by those teaching methods grouped for Lesser Usage at the Secondary Level. The same would hold true for the category for Lesser Usage at the Primary Level which was most often elaborated by those teaching methods grouped in the Greater Usage category at the Secondary Level. The revised frequency counts for the teaching methods in the category of Equal Usage, at the Primary and Secondary Level, were small. Thus, they could have contributed to or received from any of the other two categories.

Overall Factors that may have Affected the Results of the Video Tape Analysis

The premise stated that the I-E's would utilize the teaching methods in the category for: Greater Usage more frequently; Lesser Usage less often; and Equal Usage approximately the same number of times, than the I-C's. Possible causal factors that may have contributed to the premise not being supported are as follows:

(1) The reduction in the number (N) of interpreters, from 5 to 3 matched pairs, who actually participated in the study may have limited the applicability of the results. If there was a larger number of matched pairs involved in the study more of a discrepancy or similarity between the I-C's and the I-E's may have appeared in the results. The greater the N, in any study, the more likelihood that the population studied is represented accurately and thus, "the smaller the sampling error" (Isaac & Michael, 1971, p. 147). With a smaller N there is a greater chance of the population sample not being represented accurately, that is, the sample that participated in the study may have been more homogeneous than the actual population.

(2) The possibility of inaccurate completion of the Interpreter Questionnaire #1 by the interpreters may have an affect on the results of the study. The information from Interpreter Questionnaire #1 (see Appendix II) was used to match pair the interpreters. If any of the interpreters left out any particulars then this may have resulted in an inappropriate selection of matched pairs. There were eight items that

required each interpreter's response. With the information received from each interpreter the prior categories that were used to match pair the interpreters were: (a) experience with the age group of children and/or adults; (b) the type of setting in which the involvement took place; (c) whether there were any participants who have a disability and the identification of the type of disability; (d) the number of years of involvement with each group identified; and (e) how far back was the involvement for each identified group. For example, if an interpreter had failed to identify a particular age group they had previously been involved with then he or she may not have been matched with the most appropriate person from the opposite group. Another example would be the vagueness of response by some of the interpreters. That is, for the item "type of setting", one interpreter was very specific and stated "basketball" (I-E-1) while another was more vague in his response and said "outdoor" (I-C-2). A possible reason for the differences in responses could be in regard to the phrasing of the question. A solution would be to provide an example to the kind of response required and/or to have met with each interpreter after the completion of the questionnaire and review every answer that was identified by the researcher as being too vague. Thus, the mismatched pairing of any interpreter could have lead to an inaccurate compilation, assessment, analysis and interpretation of the results.

(3) The lack of natural history knowledge and interpretative experience by an interpreter may have had an influence on the results. This lack of knowledge and/or experience may have produced a personally perceived feeling of being unable to adequately meet the needs of the children who have mild developmental disabilities. This feeling of personal inadequacy may have been highlighted by the information presented during the Experimental In-Service Leadership Training Sessions. Some of them may have felt overwhelmed by being an interpreter for the first time compounded with learning new material (natural history and learning strategies of children who have mild developmental disabilities). Thus, this "aroused" stress may have lead to an inability to "perform" as well as they could have given previous natural history knowledge, teaching experience and involvement with children who have mild developmental disabilities.

(4) A factor with regard to the scripting of the video tapes for both groups of interpreters may have indirectly affected the results. The problem that

arose was with regards to speaker identification. The causes of this difficulty were as follows: (a) having more that one person talking at the same time; (b) when children and/or interpreters talked too fast and /or were unclear in their pronunciations; and (c) external noises such as airplanes flying overhead, ski-doo's, skiers, the crunching of the snow as the group walked from site to site, the voices of the video technicians, teachers or teaching assistants who had accompanied the group. There were times when the researcher was unable to identify the speaker and/or what was being said which resulted in those bits of conversation not being counted in the study. This may or may not have affected the results of the usage of the categories of teaching methods by the I-C's and the I-E's.

(5) A fifth factor that may have influenced the results of the study in some way was what Isaac and Michael (1972) call the "pitfall in 'method' studies" (p. 61). Isaac and Michael stated that "it ... [was] dangerous to assume that two teachers ... [were] actually teaching with the same method. Observers often report[ed] critical differences that suggest[ed] two versions of a given method. Such an interaction ... [would be] crucial in making meaningful interpretations" (p. 61). For example, every teacher would have nuances in their tone of voice, facial expressions, body language and so on, that could cause inconsistences in the identification of the teaching method being observed. In relation to this study even though the researcher used one common definition for each teaching method and the observations verified, the analysis of the scripted portions of video tapes could still contain inaccuracies.

(6) The fact that the match paired interpreters did not necessarily work with children from the same school may or may not have biased the results towards the control or experimental group of interpreters. Only one matched pair of interpreters (I-C-1 and I-E-1) taught children from the same classroom, on the same day of the study. There may be nuances between children from different classrooms in the way they respond to such things as "classroom" rules, discipline, visitors and outings. With match paired interpreters working with children from different classrooms one member of the pair may have had very little problem with "discipline". The other member of the match paired set may have spent half of his or her time trying to get the children to attend to the activities that he or she had planned. With a difference in the actual time spent

teaching for each member of the match paired set an inaccurate frequency count would result in the number of times each teaching method in a category for Greater, Lesser and/or Equal Usage was employed. This latter final outcome in the utilization, by the control and experimental group of interpreters, with regard to the teaching methods comprising the categories of Greater, Lesser and/or Equal may have differed considerably from the present results. Thus, the results may have shown a wider discrepancy, or a greater similarity between the control and experimental group of interpreters.

(7) The possibility that the Experimental In-Service Leadership Training Sessions were too short in duration may have biased the results toward the control group. This condensed type of in-service method of staff training is frequently found in the recreation and leisure delivery system. For example, summer staff in a nature centre may participate in in-service training at the start of the season and be evaluated at the end. The summer staff would subsequently receive feedback with regard to their work performance at the end of the season. The timing of the feedback presentation to the summer staff is inappropriate because they have no opportunity to correct their mistakes and have a reevaluation of their performance.

The above type of in-service is similar to the way the Experimental In-Service Leadership Training Sessions were organized. Every interpreter in the experimental group was provided with information about children who have mild developmental disabilities along with an opportunity to role-play at presenting an activity to these children. At the conclusion of the role-playing session every interpreter was given feedback with respect to the teaching methods and strategies that he or she had used. Each interpreter in the experimental group was then sent out to do a natural history interpretative programme with children who have mild developmental disabilities. No feedback was given to any interpreter pertaining to the teaching strategies and methods that he or she employed, therefore, the education of each interpreter was limited by time and opportunity.

Summary

The discussion from the results of the video tape analysis does not indicate support for the premise of the study. That is, the experimental group of interpreters did not necessarily use the teaching methods in the category for Greater Usage significantly more often than the control group. But overall, for both the Primary and Secondary Levels, they employed this group of teaching methods as frequently or slightly more often, than the control group of interpreters. This latter comparison was seen by comparing Figures 8 and 11.

For the teaching methods comprising the category for Lesser Usage the opposite of what the premise stated took place. The experimental group of interpreters were the group who employed the teaching methods in this category slightly more often than the control group. Whereas the premise stated that the control group of interpreters would use the teaching methods in this category more frequently than the experimental group.

The last grouping of teaching methods were those subsumed in the category of Equal Usage. The premise for these teaching methods was supported at the Primary Level but not at the Secondary Level. At the Primary Level, the experimental and control group of interpreters employed this group of teaching methods about equally. There was no significant difference in their user patterns. With the Secondary Level teaching methods the control group of interpreters employed the teaching methods subsumed in the category for Equal Usage significantly more often than the experimental group.

Conclusion

This chapter contains information about the populations and the interpretative programmes that were part of this study. The results of the Interpreter Questionnaire #2, Section II and video analysis were also included in this chapter. No statistical testing was done on the Interpreter Questionnaire #2, Section II because of the small number of participants but the data were visually represented by the use of tables accompanied by a written summary. The results of the video taped data were presented in this chapter with the use of statistical tables and scattergrams.

The study was designed to try and answer the question posed in Chapter One. From the information discussed, in the Interpreter Questionnaire #2, Section II section of this chapter, with regard to the interpreters responses to the children and the programming, the experimental group appears to have benefited from the Experimental In-Service Leadership Training Sessions. The experimental group of interpreters seemed pleased with the way the various aspects were developed and felt in control of the programme and the children. While the control group reported feeling unhappy, confused and not in control of the situation. One of the I-E's, during the debriefing session, stated that she found the information she received during the in-service leadership training sessions to be useful in helping her understand what level the children were at with regard to their cognitive ability. Thus, the experimental group of interpreters benefited from the specialized training and generally were more satisfied with the results of their efforts to meet the needs of the children, who have mild developmental disabilities, in their care.

The reasons and factors identified and discussed, with regard to the video tape data results, as to the general nonsupport of the premise in this study are just assumptions. But the most probable cause for the nonsupport is that more time was probably needed to conduct the Experimental In-Service Leadership Training Sessions. The extra period of time would allow for a succession of teaching, observation and feedback for the members of the experimental group of interpreters. Having one short period within a classroom for role playing and feedback prior to the actual delivery of the programme to the children would not have been enough time to change the interpreters teaching behaviours which were developed through a lifetime of experience.

CHAPTER FIVE

Summary

Statement of the Problem

The primary focus of this study was to address the needs of interpreters seeking to relate to children who have mild developmental disabilities. This was done by providing the interpreters with information on (1) effective teaching techniques to use with children who have mild developmental disabilities; and (2) research that identified learning strategies used by children who have mild developmental disabilities (Das,1972, 1973a, 1973b; Das & Bower, 1972, 1973; Das & Cummins, 1978; Das, Kirby & Jarman, 1979). The above stated problem was addressed through the answering the question posed in Chapter One.

Significance of the Study

This study is significant in the areas of applied and theoretical research. In the area of applied research this study produced a manual (In-Service Leadership Training Manual) that focused on the training of interpreters in order for them to effectively modify and present an interpretative programme to children who have mild developmental disabilities. The expected impact of the Experimental In-Service Leadership Training Sessions on the interpreters was to have led to an awareness of the different strategies these children use to process information. A second expected impact on the interpreters was on their ability to employ teaching methods suited to the children for whom they were responsible.

In the area of theoretical research the study linked the interpreters, docents and environmental educators with various developmental theories that had been integrated into information processing systems which could then be applied to the field of interpretation.

The information and knowledge gained from this study sought to accomplish five objectives which appear in Chapter One. The results of the first three objectives, which came out of applied research, appear in the In-Service Leadership Training Manual. The fourth objective focuses on the application of theoretical research to the field of interpretation while the fifth objective exposes areas of theoretical research that still need to be explored and applied. The latter objective is the subject of the last portion of this chapter.

Summaries and Conclusions

Objective #1

Educators need to know who their audience is in order to develop and implement programmes that will engage the children instead of bore them. Many leading environment educators and interpreters (Tilden, 1977; Edwards, 1979) have stressed the importance of knowing the make up of the audience. One of Tilden's (1977) principles of interpretation is that children should have programmes designed specifically for them and not watered down versions of those developed for adults.

Information from the literature review (Chapter Two) was used to develop an in-service leadership training programme which was given to the experimental group of interpreters in order to accomplish the objective of knowing the client. This programme included the Following topics: (1) the various cognitive theories with regard to their processing of information; (2) social skill levels and behaviours that they may or may not have when compared to their peer; (3) teachers and mothers perception of them (4) and its effect on their social and emotional development; and (5) their level of ability to undertake gross and complex motor skills, and their physical dexterity when compared to their peers.

Objective #2

An outline for an in-service leadership training programme, divided into three sessions, was developed and implemented as part of this study. (See Appendix III for the Outline and Appendix V for the Research Schedule.) The sessions included such topics as: (a) definitions and meanings to such terms as developmental disability, and mild developmental disability; (b) characteristics of children who have mild developmental disabilities, what are some of the similarities and differences when they are compared to their peers; (c) teaching methods and techniques-a discussion of the differences, pros and cons when using them with children who have developmental disabilities; (d) planning natural history interpretative programmes-lesson plan development and modifications; and (e) evaluating children's behaviours to identify if they are interested, bored, distracted and so on. The presentation methods included: brainstorming, class presentations, discussions, pre-recorded video tape programme, lecture, group exercises, demonstrations and role playing.

After the experimental group of interpreters had participated in these sessions they then presented a natural history interpretative programme to children who have mild developmental disabilities. The interpreters were then asked to evaluate the Experimental In-Service Leadership Training Sessions. The evaluation form was Section I of Interpreter Questionnaire #2 (see Apendix VII). The responses made by the experimental group of interpreters were positive. The information about children who have mild developmental disabilities benefited each of the interpreters from the experimental group in their preparation and involvement time with their group of children.

Objective #3

Techniques to modify regular children's programmes, for successful use with children who have mild developmental disabilities, by educators were achieved in this study. The section "Teaching Methods and Strategies", from Chapter Two, outlined the process that educators, such as interpreters, docents and environmental educators, could follow in order to modify their planned programmes for children who have mild developmental disabilities.

The experimental group of interpreters responses in Interpreter Questionnaire #2 (see Appendix VII) for both sections were generally very positive about their use and application of the information that they had received. These interpreters indicated that they were glad that they had been given information about the children and about the techniques that would assist them in modifying regular children's programmes.

The overall responses from the control group of interpreters in the Interpreter Questionnaire #2 for both sections indicated that the general information that they had received about children and about teaching techniques were not helpful to them in this situation. The in-service leadership training sessions that the I-C's had participated did not include information about children who have mild developmental disabilities. This lack of information about the children was a frequent comment made by the I-C's in the Interpreter Questionnaire #2.

In comparing the responses of the experimental with the control group of interpreters to Interpreter Questionnaire #2 the I-E's were more positive and perceived that they had made modifications to their programme. Whereas the I-C's perceived the exact opposite, in that they did make some modifications but they were not comfortable with what they had done. With regard to the perceived usage of the teaching methods by each group the premise is supported. The results of the perceived usage by both groups had the experimental group using the teaching methods categorized for: Greater Usage more often; for Lesser Usage less frequently; and for Equal Usage about the same number of times as the control group of interpreters.

The results from the statistical analysis of the video tapes do not support the premise. There were some differences in the usage of the teaching method categories between the two groups of interpreters but the only significant difference shown was with the category for Equal Usage at the Secondary Level (see Chapter Three, Definitions). However both groups of interpreters perceived their usage of the teaching method categories and the comments offered by them indicated that it was the experimental group of interpreters who were better prepared and enjoyed the experience more than the control group.

Objective #4

The section on Cognitive Development in the literature review (Chapter Two) compared and discussed various theories on the strategies children who have mild developmental disabilities use in order to process information. A discussion on interpretation along with various interpretative programmes, segregated and integrated, were also presented as part of the review of literature.

The lack of information that integrated interpretation and the learning strategies used by children who have mild developmental disabilities and the support by people in various agencies, educational and otherwise, gave credence to the need for this study. An in-service leadership training programme that focused on providing interpreters with information about children who have mild developmental disabilities was developed and implemented. The sessions addressed the need to have research that focused on children who have mild developmental disabilities synthesized and accessible to the lay person, hence, information about natural history programming and lesson plan development was also included. By integrating these topics it was possible to provide modifications of teaching techniques and strategies that would benefit the client.

The results from this study indicated that the information provided to the I-E's was a resource that they perceived assisted them in their presentation of a natural history interpretative programme to children who have mild developmental disabilities. Thus the research completed by this study does complement the literature in the areas of cognitive processing by children who have mild developmental disabilities and natural history interpretation.

Objective #5

As with most studies, areas are found that require further research. As this study was a field experiment, the ability to have tight control over many of the dependent variables, as in a laboratory experiment, was not feasible. The weather, equipment and people who participated directly or indirectly in the study are examples of some of the dependent variables that affected, in some way, the out come of the study. Some of these focus on the need to gather material already published in the areas of feedback and in-service leadership training sessions. Others would require a more in-depth look at the modifications to the design of this study, in particular the way the in-service leadership training sessions are organized. The above mentioned suggestions are discussed in greater detail in the section Recommendations, Research, that conclude this section. The areas that are also covered in this following section are: Administration, Organization and Programming. This study, with modifications to tighten control, should be repeated to verify the conclusions.

Methodological Critique

General Comments

In the designing stage of this study it was reassuring to be informed by people working for such agencies as nature and environmental centres, camping associations and those working directly with people who have developmental disabilities along with school personal that this type of research was needed. Comments made by these people shared a similar theme in that they felt that practical information about children who have mild developmental disabilities was not readily accessible to them. They reiterated that information available to the lay person about these children was scarce compared to what was obtainable about children who have a moderate or severe developmental disability. These people felt that this first group of children had became "lost in the cracks". Their positive support of the study and requests to receive a copy of the manual after the study was completed, reaffirmed, from the stand point of what was not found in the literature, that this type of research was necessary.

Data Collection

Interpreter Questionnaries #1 and #2 were designed to collect data specifically for this study and therefore relied on face validity.

Data Analysis

The data analysis for this field experiment was straightforward. Interpreter Questionnaire #1 was used to match pair the interpreters who were then randomly assigned to either the control or the experimental group. Interpreter Questionnaire #2 was divided into two sections. Section I asked each of the interpreters to evaluate the in-service leadership training sessions that they attended. This section was only used to evaluate and modify the Experimental In-Service Leadership Training Sessions and, therefore, was not directly part of the study. The second section to Interpreter Questionnaire #2 focused on each interpreter's perception of the programme that they had delivered to the children, in particular the three ten minute activities that were common to all of them.

The results of the data from Section II of the second questionnaire was presented in a written form and were not statistically analyzed. Patton (1990) states that "the failure to find statistically significant difference in comparing people on some outcome measure does not mean that there are no important differences among those people on those outcomes. The differences may simply be qualitative rather than quantitative" (p. 110). Thus a greater difference may have shown itself if qualitative methods and analysis were undertaken.

Paired one-tailed *t*-tests were used for statistical analysis while scattergrams were used to visually assess the data from the scripted portions of the video tapes used in this study.

Summary

An intense review of the literature found no research that was based on filling the needs of interpreters who wanted to make their natural history interpretative programmes more accessible to children who have mild developmental disabilities. There were some studies that looked at programme development and implementation of segregated and integrated programmes for children who have varying disabilities. As such there was enough support in the literature and otherwise to identify a need to research the following question:

> Do the Experimental In-Service Leadership Training Sessions have an effect on the interpreters in their presentation of interpretative programmes for children who have mild developmental disabilities?

The fulfillment of the objectives and the results from this study lend themselves to answering this question in the affirmative. The Experimental In-Service Leadership Training Sessions that were designed to provide a group of interpreters with information on the learning processes of children who have mild developmental disabilities was accomplished. This group of interpreters was also provided with effective teaching techniques that would assist them in the modification of natural history interpreter programmes for these children. Even though the statistical results of this study do not show any significant difference between the I-E's and the I-C's use of the teaching method categories for Greater and Lesser Usage the interpreters themselves perceived otherwise.

The responses from the Interpreter Questionnaire #2 indicated that the experimental group of interpreters were pleased with the way their programme developed and with the behaviour of the children. These interpreters were satisfied with the content of the Experimental In-Service Leadership Training Sessions and perceived that they had indeed used those teaching methods that were identified as being the most suitable for use with children who have mild developmental disabilities. While the control group of interpreters responses were the opposite. They were not happy with the way their programme developed or with the behaviour of the children. The I-C's felt that the children were bored and disinterested with the activities and the information that was being presented to them. The control group of interpreters even perceived themselves as having used the teaching methods in the amount that would support the premise of the study. That is, that the teaching methods comprising the category for Greater Usage would be used more frequently by the experimental group of interpreters than the control group. The I-E's would employ the teaching methods in the category for Lesser Usage less often then the I-C's and that both groups would use the teaching methods subsumed in the category for Equal Usage about the same amount.

As stated by Patton (1990) and other researchers, the difference in a study may not be significant quantitatively, but it may be if analyzed qualitatively. The results do indicate strongly that the experimental group of interpreters did perceive that they benefited from their Experimental In-Service Leadership Training Sessions.

Recommendations

Introduction

The following recommendations are made from the perspective of the researcher's experience and the results of the study. The recommendations are made in order to be of benefit to others who might undertake similar studies and/or include video technology into a research project. The following recommendations are divided into four sections: (1) research; (2) administration; (3) organization; and (4) programming.

Research

Literature Review

(1) There is a need to take a closer look at feedback, both positive and negative as a teaching technique. The experimental group of interpreters may have provided more positive feedback than the control group of interpreters.

Though the I-E's did perceive themselves as having given the children slightly more positive feedback then the I-C's it would be interesting to find out if this was true. One of the teaching strategies that was stressed during the Experimental In-Service Leadership Training Sessions was the importance of providing more positive feedback to children who have mild developmental disabilities than would be the case to their peers. Research has shown that children who have developmental disabilities are more apt to remember the negative than the positive feedback that they are given (Hewett & Forness, 1984).

(2) A literature review on in-service leadership training sessions and programmes that focus on teaching methods and strategies is needed. This review would identify those techniques and methods of presentation that work best: (a) to stimulate the participants involvement in the sessions and to help them internalize the information that is being provided; and (b) to change those behaviours that are not conducive to assisting children who have mild developmental disabilities to learn and enjoy an interpretative programme.

Research Study

(3) The development of an in-service leadership training programme that would include the comparisons made in this study but also allow for more practice and feedback time for each interpreter. A possibility may be to have: (a) one session of in-service leadership training event for both the experimental and control group of interpreters, whereby, they have the opportunity to test their delivery of programmes to children. The experimental group of interpreters could work with children who have mild developmental disabilities and the control group with children who do not. (b) Both groups would be video taped and then, with the information from the recorded tapes be provided with feedback as to the usage of teaching methods and strategies. (c) A second presentation of programmes by both groups of interpreters would take place. This time both groups would have children who have mild developmental disabilities. This second presentation would also be video taped with the interpreters receiving feedback from the researcher.

(4) Another study may be done just looking at one group of interpreters and their participation in the in-service leadership training sessions and

programme presentation to children who have mild developmental disabilities. The format would be similar to that stated above, where the interpreters would have two in-service sessions each followed by a programme to children and then a feedback session with regard to their use of teaching methods and strategies.

(5) For the research undertaken in either (3) and/or (4), above, the number of match paired interpreters participating in the study should be increased to more than three sets in order to include a larger sample of the population.

(6) The researcher observed, while viewing the video tapes of the natural history interpretative programmes, that some children were more affected than others by the presence of the video technicians. It is unknown to the researcher whether or not the prior taping experience in each classroom was of any help in reducing the effect of the camera and video technicians on the children. A study could look at the effects of video taping on children in classrooms and in field settings. A possible question "Is there a minimum number of video taping sessions which need to be done in order for the children to ignore the camera and the video technician?"

Administration

Data Collection

(7) The time span for the collection of data was limited to one week in the middle of March. This time period was the most convenient for everyone with regard to school scheduling. Another time period may be found that could reduce some of the dependent variables, such as weather and the scheduling around holidays and examinations, for all participants. A greater expanse of time would allow for: (a) a greater number of participants, interpreters and children to be involved in the study, thus a greater sample size; (b) an orientation session for the video technicians to acquaint themselves with the particular video cameras prior to the actual recording sessions; and (c) a longer in-service course for the interpreters which would provide for more practice and feedback time.

(8) The collecting of the data was straightforward for both questionnaires and the interpretative programmes. But in hind sight changes could have been made in the procedures for both methods of data collection. It would have

been more profitable to have interviewed, on a one to one basis, every interpreter to ensure that each questionnaire was fully completed. Some of the responses on the questionnaires were: (a) vague, e.g., "outdoors" while others wrote "playground"; (b) lacked explanation, e.g., in Interpreter Questionnaire #2 space was provided for each interpreter to explain their response but some failed to do so; and (c) misreading of the question, e.g., answered the questions in Section I of Interpreter Questionnaire #2 with regard to the natural history programme that they had just presented instead of the in-service leadership training sessions that they had previously attended. With the added dimension of the researcher talking with each interpreter about his or her responses to both questionnaires a qualitative aspect of this study could have been introduced. It may be that this type of study lends itself more towards qualitative rather then quantitative data collection.

(9) Interpreter Questionnaire #2 was undertaken in the out of doors immediately after each interpreter had finished presenting his or her programme. The questionnaire may have been completed more accurately if they had a room to go to, something hot to drink and were not under pressure to go to their next commitment.

(10) It took a long time to transcribe the audio portions of the video taped interpretative programmes that were used in this study. It would have been quicker if more than one person had undertaken this task, or if specific time intervals could have been studied rather than the entire teaching experience. Using a more clement weather timeframe would have prevented the dysfunction of equipment and batteries.

Interpreter Questionnaires

(11) After each questionnaire has been completed and returned to the researcher the following step is suggested: the researcher and the interpreter should arrange a time to meet. There would be two meetings: prior to the in-service leadership training sessions and after the presentation of the interpretative programme.

(12) Integrating a qualitative aspect into the research may confirm and support the conclusion of this study, that the Experimental In-Service Leadership Training Sessions had a positive effect on the I-E's. The inclusion of qualitative data gathering would occur during the two times

that the researcher and interpreter meet to discus his or her responses to the questionnaires.

Other

(13) Try to have all or most of the video cameras the same make and model so that parts, for example, batteries, can be interchanged if the need arises. This would prevent a reduction in the time length of each recorded video tape and may then allow for actual raw data and not revised data to be used as research results.

(14) To make transcribing of the conversations easier a wireless microphone for the interpreter and each child in the group would be ideal. This would improve auditory clarity on the video tape.

Organization

Arrival

(15) To prevent interpreters from going to the wrong site or overlapping sites they should be provided with a map showing the exact spot where their natural history interpretative programme is to take place.

(16) Each interpreter should be informed that his or her primary concern is for the children. Each interpreter and video technician should be at the site 30 minutes prior to the childrens actual arrival. This extra time also allows for each interpreter to get his or her site ready and for the video technician to review the video camera that he or she will be using on the day.

Scripting Video Tapes

(17) To help the person transcribing the video tapes, the following should be required: (a) each interpreter should speak loudly and clearly and if possible face the camera so that his or her voice could be picked up by the microphone in the video camera. (wireless microphone on each interpreter would be best); and (b) the video technician should try and be as close to the interpreter that he or she is recording in order to capture the interpreter's voice, facial expressions, and body language.

In-Service for the Video Technicians

(18) The following items can be covered in a meeting or an in-service session for all the video technicians who will be assisting in the collection of data for the study. (a) Have all the video cameras available at one time prior to the actual data collection times so that each video technician becomes familiar with the idiosyncrasies of every camera to be used in data gathering. This will prevent confusion and delay on the study site. (b) To prevent unnecessary competition of other voices with that of the interpreter and the children it is important that the video technician not speak. This is because the video technician is close to the camera microphone and his or her voice therefore dominates over those in the class. (This principle is the same for those persons, e.g., teachers, teachers aids, who may be present and at times are next to the video technician and the camera microphone.) (c) The video technician is responsible for moving in such a way as to be in front of the interpreter so that voice recording is clear on the video tape.

Programming

(19) It is important for the interpreters to be dressed appropriately for the weather. By being prepared and clothed for the circumstances of the day the interpreters themselves set an example of how to dress and be prepared for a change in weather.

(20) Each interpreter needs to be conscious of having only one person speaking at any particular time. This includes the interpreter being conscious of his or her own interruptive behaviour. Every interpreter must reinforce this positive behaviour of no interruption because then it enables: (a) everyone to be listened to and thus this shows respect for the person who is speaking and for what he or she is saying; (b) a clear understanding of what is being said with less chance of being misunderstood; and (c) allows for the microphone to pick up only one voice at a time instead of two or more.

(21) Each interpreter should be conscious of other groups using the trail or area and try to refrain from entering another interpreter's site where he or she would be a distracting factor. When an interpreter and his or her group enter another's site this can result in some of the following: (a) the

children from both groups can become distracted resulting in loss of focus for members of either group; (b) setting the two groups of children at each other thereby possibly causing both interpreters to lose control over their groups; and/or (c) having the voices of the entering group carry over towards the other group thereby reducing the children's attention away from their interpreter.

A solution to this problem may be to have a buffer zone between groups to reduce the possibility of more than one grouping being on the same site. Another possibility, depending on the type of site, is to have each group rotate clockwise at set periods of time.

(22) Each interpreter should be well prepared and know their site. That is: (a) every interpreter should not only have lesson plans outlined for the full 50-60 minute programme which is to be presented but he or she also needs to have additional activities planned and prepared in case of an emergency. For example, the activities that the interpreter planned may be exhausted before the actual scheduled ending. (b) Each interpreter needs to be familiar with their site and have a general knowledge of the types of animals and plants that may be found and/or frequent the area. This includes those found below ground level and under snow, leaf litter and bark; at ground level, general working and sight level, canopy level and above. (c) When an interpreter is familiar with his or her site then he or she is better able to supplement the programme with objects and artifacts.

(23) The interpreters need to be prepared to modify and change their approach, and to be able to adapt their programmes with regard to the children and/or weather conditions and any other unforeseen circumstances. For example if it is especially cool or cold out, or the group is spending a considerable time in the "shade" then the interpreter should have the children involved in a "moving" type of activity. The important thing is for each interpreter to be flexible and adapt to the circumstances that develop.

(24) Again, if the children are verbally complaining or through their body language are saying that they are uncomfortable in some way, e.g.,cool, cold, wet, then it is incumbent upon the interpreter to respond immediately and change the circumstances. For example have the children play a game

that will warm them up. The interpreter should change, modify or adapt an activity to be able to accommodate this kind of situation.

(25) Each interpreter needs to be cognizant of alternating an activity with a "Lecture" (provision of information), even if it is a question and answer on an artifact or object. Reasons behind changing teaching methods are: (a) it keeps the programme more exciting and challenging for the children; (b) it helps to redirect the children's focus and thereby keeping their attention on the interpreter and/or activity; (c) if it is cold out and the children do an activity with a lot of movement then they will stay warmer for a longer period of time; (d) it helps keep the children from getting bored, therefore, they will be less likely to become disruptive, i.e., tease each other; and (e) it assists the children in maintaining their focus on the interpreter and/or activity since these children's attention spans are shorter and they are more easily distracted than their peers.

Summary

The recommendations made for this study were presented in four sections. The first section focused on the areas that are pertinent to this study and would indicate either a support for or against the research results. The next three sections discussed areas of improvement for a similar research project or one that would require video technicians as participants in the collection of data. It is hoped that these recommendations would be of benefit to others who have an interest in this field of research.

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Appendix I

Definition of Teaching Methods
Ground Rules
Clarification of Teaching Method Definitions

TSA OBSERVATION SYSTEM

CLOSED METHODS

Lecture - teacher talk or information giving.

Question - teacher interrogative request for specific information.

Demonstration - teacher supplements talk with visual clues or external props.

Direction - teacher commands or insists students to comply.

Mastery - teacher drills or practices specifics with students.

Problem-Solving - teacher sets or poses a situation which requires the student to arrive at a predetermined solution.

OPEN METHODS

Clarification - teacher permits the student to express or elaborate feelings, opinions or thoughts without interruption.

Inquiry - teacher pursues and challenges student statements, or permits students to question.

Dialogue - teacher allows students to interact, react, and discuss a topic or idea with interjections, but not inhibiting behavior.

Roberson, E. W (1970). Developing observation systems. (ERIC Document Service No. ED 0567 987) p. 34.

Ground Rules from TSA Observation System- E. W. Roberson.

Ground Rule 2 - If, when coding levels of the Methods, ... you are uncertain concerning two levels within the category, always code the level farthest from the top ...[of the definition list]. For instance, if you are uncertain as to whether the method is Lecture or Demonstration, you would mark Demonstration. (Roberson, 1970, p. 38)
[Revision- This will pertain to each level , Primary or Secondary, but not between levels.]

Ground Rule 9 - When the teacher asks a question and names a student at the conclusion of the question, the method level of Direction is marked (i.e., "What time is it, Jack?"). When the teacher identifies the student and the poses the question, the method level of Question is marked (i.e., "Jack, what time is it?"). (Roberson, 1970, p. 39)

Roberson, E. W (1970). Developing observation systems. (ERIC Document Service No. ED 0567 987) p. 38 & 39.

Clarification of Teaching Method Definitions

While the researcher used the TSA Observation System (Roberson, 1970) because of the **ambiguity** of the definitions the following points were considered a long with the definitions of the Teaching Methods.

CLOSED METHODS
Lecture - could be one statement providing or giving information.

Question - the question allows for a variety of answers. The interpreter is opening the floor for answers, e.g., A question in Social Studies.

A question is identified as a Question when the interpreter does not say the students name. RE: TSA Ground Rule 9 via Ground Rule 2.

A question asked by the interpreter with no identified name attached to the question will be scored as a Question.

If the question came from a Demonstration, then score as the Primary method - De (Demonstration) and as Secondary method - Q (Question).

Demonstration - if a interpreter points to a tree, bird feeder, squirrel. and so on it is considered a De (Demonstration).

When the Interpreters are talking about and pointing to a beaver stump then it is a De (Demonstration). At the "instance" when the Interpreter talks about beavers then the method switches to L (Lecture).

For this study sight is considered an external prop, therefore if the students' sight are in any way blocked from seeing the object or artifact being discussed then it cannot be scored as a De (Demonstration).

Hearing (listening), touching, smelling, tasting, and sight are considered external props.

If a interpreter is writing on a board (e.g., blackboard) it is considered a Demonstration.

Only when the Interpreter has pointed things out and/or provided the artifact is it scored as a De (Demonstration). When the student points things out it is **not** considered a De (Demonstration).

Direction - is directing a question to a specific person. COMPLIANCE is the key for this Teaching Method.

Mastery - each student has to go over and over (practice) the task again and again. It is not when each student gets one turn at the same task.

Problem-solving.- to eliminate all other possibility and get the one correct answer, e.g., a math question.

PS (Problem-solving) sets the situation/the environment and what is required is a predetermined solution (e.g., What colour of coat is S1 wearing right now?).

PS (Problem-solving) sets the student up, e.g., Can you guys smell anything this morning?
De (Demonstration) is using the "smell", e.g., What can you smell?

OPEN METHODS

Inquiry - the interpreter is involved in the dialogue with the students by answering the students questions e.g.,What? Why?.

A student's I (Inquiry) question comes because of the information/statement(s) that the interpreter has just made or after the interpreter has directed him/her towards something. From the information or direction there is a response from this student who is then seeking further clarification.

In terms of Ground Rules the researcher is looking at the interpreter answering the I (Inquiry) made by the student(s).

The I (Inquiry) is directed at the interpreter and not at the class in general or towards the student's peers.

Dialogue - allows involvement by the interpreter, but usually only the students are involved (refer to the definition).
When students are in D (Dialogue) and are referring to the De (Demonstration) then it is scored as- Primary method De (Demonstration) & Secondary method D (Dialogue).

There are times when specific students are not identified yet the response recorded is recognized as coming from **one particular** student. So when there is D (Dialogue) and there is only unidentified student responses then do not mark the conversation. Only when the conservation is know to come from more than one student, even if the students who have contributed to the responses are not identified, can the responses be scored as D (Dialogue).

Appendix II

Interpreter Questionnaire #1
and
Summary of Results

Interpreter Questionnaire # 1

NAME:____

If you need **more writing space** to answer the questions than **use the back pages** of the questionnaire.

Section I. EXPERIENCE WITH CHILDREN

1) Have you taught or supervised children in a recreation program?

Yes (please continue to Question **2**)
NO (please go to Question **3**)

2) Please fill in the table where appropriate.

	Taught or Other	Age Group	Type of Setting	Disability ? Specify	# of Years of Involved.	How Long Ago Was This?	Voluntary Position	Paid Position
2a	Taught	5 and under		Yes / No			Yes / No	Yes / No
2b	Other than taught	5 and Under		Yes / No			Yes / No	Yes / No
2c	Taught	6 to 8		Yes / No			Yes / No	Yes / No
2d	Other than taught	6 to 8		Yes / No			Yes / No	Yes / No
2e	Taught	9 to 11		Yes / No			Yes / No	Yes / No
2 f	Other than taught	9 to 11		Yes / No			Yes / No	Yes / No
2g	Taught	12 to 14		Yes / No			Yes / No	Yes / No
2h	Other than taught	12 to 14		Yes / No			Yes / No	Yes / No
2 i	Taught	15 to 17		Yes / No			Yes / No	Yes / No
2 j	Other than taught	15 to 17		Yes / No			Yes / No	Yes / No

Continue to Question 3

3) Have you taught or supervised children in a institutional setting (e.g., school, Sunday School, hospital, etc)?

Yes (please continue to Question 4)

NO (Go to Section II - EXPERIENCE WITH ADULTS)

4) Please fill in the table where appropriate.

	Taught or Other	Age Group	Type of Setting	Disability ? Specify	# of Years of Involved.	How Long Ago Was This?	Voluntary Position	Paid Position
4a	Taught	5 and under		Yes / No			Yes / No	Yes / No
4b	Other than taught	5 and under		Yes / No			Yes / No	Yes / No
4c	Taught	6 to 8		Yes / No			Yes / No	Yes / No
4d	Other than taught	6 to 8		Yes / No			Yes / No	Yes / No
4e	Taught	9 to 11		Yes / No			Yes / No	Yes / No
4 f	Other than taught	9 to 11		Yes / No			Yes / No	Yes / No
4g	Taught	12 to 14		Yes / No			Yes / No	Yes / No
4h	Other than taught	12 to 14		Yes / No			Yes / No	Yes / No
4 i	Taught	15 t0 17		Yes / No			Yes / No	Yes / No
4 j	Other than taught	15 to 17		Yes / No			Yes / No	Yes / No

Continue to Question 5

Section II EXPERIENCE WITH ADULTS

5) Have you taught or supervised adults in a recreation program?

Yes (please continue to Question 6)

NO (please go to Question 7)

6) Please fill in the table where appropriate.

	Taught or Other	Age Group	Type of Setting	Disability ? Specify	# of Years of Involved.	How Long Ago Was This?	Voluntary Position	Paid Position
6a	Taught	18 to 25		Yes / No			Yes / No	Yes / No
6b	Other than taught	18 to 25		Yes / No			Yes / No	Yes / No
6c	Taught	26 to 45		Yes / No			Yes / No	Yes / No
6d	Other than taught	26 to 45		Yes / No			Yes / No	Yes / No
6e	Taught	46 to 59		Yes / No			Yes / No	Yes / No
6 f	Other than taught	46 to 59		Yes / No			Yes / No	Yes / No
6g	Taught	60 to 75		Yes / No			Yes / No	Yes / No
6h	Other than taught	60 to 75		Yes / No			Yes / No	Yes / No
6 i	Taught	76 and older		Yes / No			Yes / No	Yes / No
6 j	Other than taught	76 and older		Yes / No			Yes / No	Yes / No

Continue to Question 7

7 Have you taught or supervised adults in a institutional setting (e.g., school, Sunday School, hospital) ?

Yes (please continue to Question **8**)

NO

8) Please fill in the table where appropriate.

	Taught or Other	Age Group	Type of Setting	Disability ? Specify	# of Years of Involved.	How Long Ago Was This?	Voluntary Position	Paid Position
8a	Taught	18 to 25		Yes / No			Yes / No	Yes / No
8b	Other than taught	18 t0 25		Yes / No			Yes / No	Yes / No
8c	Taught	26 to 45		Yes / No			Yes / No	Yes / No
8d	Other than taught	26 to 45		Yes / No			Yes / No	Yes / No
8e	Taught	46 to 59		Yes / No			Yes / No	Yes / No
8 f	Other than taught	46 to 59		Yes / No			Yes / No	Yes / No
8g	Taught	60 to 75		Yes / No			Yes / No	Yes / No
8h	Other than taught	60 to 75		Yes / No			Yes / No	Yes / No
8 i	Taught	76 and older		Yes / No			Yes / No	Yes / No
8 j	Other than taught	76 and older		Yes / No			Yes / No	Yes / No

Interpreter Questionnaire #1 Summary Chart 1a

		Control				Experimental			
		Recreation		Institution		Recreation		Institution	
Taught or Other	Age Group	Volunteer	Paid	Volunteer	Paid	Volunteer	Paid	Volunteer	Paid
Taught	5 and under	1	1	0	0	0	1	0	0
Other than taught	5 and under	0	1	0	1	0	1	0	0
Taught	6 to 8	0	2	1	0	0.5 *	1.5 *	0	0
Other than taught	6 to 8	0	1	1	0	0	1	0	0
Taught	9 to 11	0	2	1	0	0. 5 *	1.5 *	0	0
Other than taught	9 to 11	1	1	1	0	0	1	0 9	0
Tought	12 to 14	0	2	0	0	1. *5	0.5 *	0	0
Other than taught	12 to 14	1	1	0.5 *	0.5 *	1	0	0.5*	0.5*
Taught	15 to 17	0	1	0	0	1.5 *	0.5 *	1	0
Other than taught	15 to 17	1	1	0	1	0	1	1	0
Taught	18 to 25	0	0	0	0	1	0	0	0
Other than taught	18 to 25	2	0	1	0	1	0	0	0
Taught	26 to 45	0	0	0	0	1	0	0	0
Other than taught	26 to 45	2	0	1	0	1	0	0	0
Taught	46 to 59	0	0	0	0	1	0	0	0
Other than taught	46 to 59	0	0	0	0	1	0	0	0
Taught	60 to 75	0	0	0	0	0	0	0	0
Other than taught	60 to 75	0	0	0	0	0	0	0	0
Taught	76 and older	0	0	0	0	0	0	0	0
Other than taught	76 and older	0	0	0	0	0	0	0	0

NOTE: * identifies when an interpreter said that she or he had been paid and did volunteer work in the same category
- the researcher then gave .5 point per category

Interpreter Questionnaire #1 Summary Chart 1b

Control		Experimental	
Recreation Programmes	Institutional Setting	Children - Recreational Programmes	Children - Institutional Setting
Number of Years of Involvement With Children	Number of Years of Involvement With Children	Number of Years of Involvement With Children	Number of Years of Involvement With Children
Range: 1 to 5 years	Range: 1 to 2 years	Range: 3 to 7 years	2 years
Number of Years of Involvement With Adults	Number of Years of Involvement With Adults	Number of Years of Involvement With Adults	Number of Years of Involvement With Adults
1 year	N / A	No years were given by the interpreter	N / A
Involvement with Children was ? Years Ago	Involvement with Children was ? Years Ago	Involvement with Children was ? Years Ago	Involvement with Children was ? Years Ago
Range: 1 to 5 years	A few months; 5 years	Over the past 7 years	Range: 3 to 5 years
Involvement with Adults was ? Years Ago	Involvement with Adults was ? Years Ago	Involvement with Adults was ? Years Ago	Involvement with Adults was ? Years Ago
1 year	N / A	No years were given by the interpreter	N / A
Type of Setting With Children	Type of Setting With Children	Type of Setting With Children	Type of Setting With Children
Range: day camps, outdoor camps, playgrounds	Range: school, daycare	Range: playground, specified registared programs, coached basketball, indoors and outdoors	Range: basketball class, school
Type of Setting With Adults	Type of Setting With Adults	Type of Setting With Adults	Type of Setting With Adults
Outdoors - rock climbing	N / A	Indoors	N / A

Appendix III

In-Service Leadership Training Sessions Outline

In-Service Leadership Training Sessions Outline

Method of Presentation	Specific Content for I-E Group	General Content	Specific Content for I-C Group	Method of Presentation
Brainstorm-2 groups Present above info. Discussion Fill - in missing pts. Visual Aids	Definitions: - Developmental Disability (Mental Retardation) - Mild Devel't Dis. (MMR / EMH / EMR)	Definitions	Definitions	Brainstorm-2 groups Present above info. Discussion Fill-in missing pts. Visual Aids
Brainstorm Discussion Video Tape Fill-in missing pts.	Characteristics of Children who have Mild Developmental Disabilities (similar. / differences)	Clientele Information Setting - School	Characteristics of children	Brainstorm - 1 group Discussion Video Tape Fill-in missing pts.
Discussion	Interpreters reactions and feelings on what they viewed on the video tape.	Characteristics of children	Interpreters reactions and feelings about the information received from the video tape	Discussion
Lecture Visual Aids Discussion	Which methods & techniques to use for children who have a mild developmental disability	Teaching methods & techniques	Methods & techniques to use when teaching children	Lecture Visual Aids Discussion
Group Exercise Dialogue Demonstration Role Playing - video taping of the interpreters	Regular - objectives - method - content Modified-objectives - method - content Checklist	Natural History Interpretive Programme for children	Regular - objectives - method - content Checklist	Group Exercise Dialogue Demonstration Role Playing - video taping of the interpreters
Discussion	Are they: interested, bored, etc.	Evaluation of the children	Are they: interested, bored, etc.	Discussion
Discussion	The teacher and / or the interpreters? Who disciplines? What is appropriate behaviour?	Discipline of the children	The teacher and / or the interpreters? Who disciplines?	Discussion

Appendix IV

Examples of Lesson Plans

Lesson Plan

<table>
<tr><td>Date: March 11, 13, 15, 1991</td><td>Subject: Natural History Interpretative Programmes for children between 9 and 11 years</td></tr>
<tr><td>Time: 10:30 A.M. - 11:30 A.M.</td><td>School: 4 schools within the Edmonton Catholic School System & 1 school within the Sturgeon School Division #24</td></tr>
<tr><td colspan="2">Site: Capital City Park Trail between Emily Murphy Park and Hawrelak Pk.</td></tr>
<tr><td colspan="2">Special Preparation: Permission from (1) the school system; (2) principal of the school; (3) the teacher; and (4) the parents or guardians of the children. (5) Select a site; (6) may have to receive permission to access the site; (7) request washroom facilities to be open; (8) prepare a pre-visit package for the teachers; (9) obtain/locate map(s) of site; (10) prepare site; and (11) prepare yourself - Lesson Plan preparation, artifact gathering (borrow, collect), etc.</td></tr>
<tr><td colspan="2">Goal:To help the children to enjoy a natural outdoor setting.</td></tr>
<tr><td colspan="2">Objectives: (1) Children will be able to provide ten examples of pairs of different shapes, sounds, smells, and textures found in the "forest".
(2) Children will be able to give the names of five animals that live in the "forest".
(3) Children will be able to identify five different animal homes that occur in the "forest".</td></tr>
</table>

ACTIVITY # 1 Learning to Look, Looking to See		
TIME	LESSON	TEACHING POINTS
1 Minute	Introduction	
	Who do you think lives in this forest?	PRAISE
	How might you find out?	PRAISE: look up, around, under, etc.
3 Minutes	Body	
	What tools do you have that helps you explore?	Hands - shake them; Eyes - limit vision; PRAISE
	We will use these tools to help us explore our "forest".	Ears - close them: Nose - inhale shallow / deep: Feet - look at size of foot prints
5 Minutes	Application	
	Within 5 steps find a place to sit down.	PRAISE: Sit facing different directions.
	We wil use our tools to observe who & what is around us.	Eyes to see - close ears; use hands as telescopes; Nose to smell-close eyes, ears to smell; Touch to feel-close eyes; Ears to hear (still-quiet), use hand as funnels; PRAISE
1 Minutes	Summary / Conclusion	
	Ask each child what they saw, heard, smelled, felt. Colours, shapes, size, etc.	PRAISE

ACTIVITY # 2 Wildlife is Everywhere		
TIME	LESSON PLAN	TEACHING POINTS
1 Minute	Introduction	
	Who or what else might be here?	PRAISE: Leave things as you find them. Between here and that tree see if you can find evidence of an animal having been here.
4 Minutes	Body	
	Now that we have practiced our observational skills lets go for a walk & see what else there is to see. It is IMPORTANT to walk quietly and softly.	Practice walking quietly. PRAISE: look: on the bark, under logs, around trees, etc. Explain about salting a trail - skull, scats, feathers, tracks, etc.
3 Minutes	Application	
	I want you to go (within the boundaries set) and try and find some of the artifacts I have shown you.	PRAISE: Remember to: look up, around, under, behind, etc.; leave things as you found them. Take me to the artifact.
2 Minutes	Summary / Conclusion	
	Who / what did we see?	PRAISE

ACTIVITY # 3 Everybody Needs a Home

TIME	LESSON PLAN	TEACHING POINTS
1 Minute	Introduction	
	Who has a home? Do animals? Are you an animal?	PRAISE
4 Minutes	Body	
	What cues are there that might tell you that animals live here?	Look for evidence: that shows that animals are around; of building materials animals might use to construct their homes.
	What might animal homes look like? Where do you get your food and water from?	PRAISE: Shape, size, colour, number of rooms, food, water, etc.
	Where might you find animal homes?	PRAISE: look up, around , under, etc.
	If animals have homes here where would their food and water come from?	PRAISE
3 Minutes	Application	
	Let us see if we can find more homes in our "forest".	Remember not to distrube the cues that you have found. Stand byside them and I will come to you. PRAISE: Use your: Eyes, Ears, Nose, Hands, Feet: Bark of trees; holes in the snow; up in the trees - nests, holes in the trees; etc.
2 Minutes	Summary / Conclusion	
	How many homes did we see? What were the shapes, sizes, materials made from, etc. Where was their food and water? What kind of food did they eat?	PRAISE

Appendix V

Research Schedule
and
Data Collection Schedule

Research Schedule for the Experimental and Control In-Service Leadership Training Sessions

	Experimental Group	Approx. Date	Control Group	Approx. Date	
PRIOR	Interpreter Questionnaire #1	Feb. 25	Interpreter Questionnaire#1	Feb. 25	**PRIOR**
	Project WILD Workshop	Feb. 25	Project WILD Workshop	Feb. 25	
	[*Indoor Programme*]	[*Feb. 27*]	[*Indoor Programme*]	[*Fe. 27.*]	
	[*Outdoor Progromme*	[*Mar. 1*]	[*Outdoor Progromme*]	[*Mar. 1*]	
	Experimental In-Service	Mar. 4	Control In-service Leadership	Mar. 4	
	Leadership Training Sessions	Mar. 6	Training Sessions	Mar. 6	
	[*Critique Lesson Plan, Emily*	[*Mar. 8*]	[*Critique Lesson Plan, Emily*	[*Mar. 8*]	
	Murphy Park / Hawrelak Park]		*Murphy / Hawrelak Park*]		
DURING	Experimental Programme and Data	Mar. 11	Control Programme and Data	Mar. 11	**DURING**
	Gathering & Interpreter	Mar. 13	Gathering & Interpreter	Mar. 13	
	Questionnaire #2	Mar. 15	Questionnaire #2	Mar. 15	
POST	Debriefing	Mar. 18	Debriefing	Mar. 18	**POST**
	Control In-service Leadership	Mar. 25	Experimental In-Service	Mar. 25	
	Training Sessions	Mar. 27	Leadership Training Sessions	Mar. 27	

Data Collection Schedule

PRIOR	JOBS TO DO	DATES	PRIOR	JOBS TO DO	DATES
Done	Project Supervisor & Researcher-Proj. WILD	Jan. 12			
Done	Questionnaires #1 & 2 to jurists; revise accordingly				
Done	Buy VHS Tapes - 16	Wk. Feb. 11 - 16	PRIOR: Day Before		
Done	Check out the trails between parks	Wk. Feb. 11 - 16			
Done	Phone Principles	Wk. Feb. 11 - 16	Done	Questionnaires #2, clip-boards, pencils & erasers	Mar. 10, 12, & 14
Done	Prepare Pre-Visit Pkg.	Wk. Feb. 11 - 16	Done	Masking tape, posters, artifacts, ropes , VHS tapes	Mar. 10, 12, & 14
Done	Book video /dub on 1/2 in. tape	Wk. Feb. 11 - 16			
Done	Locate Video Cameras for Classroom taping	Wk. Feb. 18 - 23	**DURING**		
Done	Confirm classroom bookings	Wk. Feb. 18 - 23	1.5 hrs. PRIOR	Collect video cameras	Mar. 11, 13, & 15
Done	Confirm Video camera & VCR bookings	Wk. Feb. 18 - 23	Done	Masking tape, posters	Mar. 11, 13, & 15
Done	Phone contact person - Confirm. Video Tech.	Feb. 18	Done	VHS tapes (5 or 3)	Mar. 11, 13, & 15
Done	Send details to Video Person Contact - times, places, alt.locat., map	Wk. Feb. 17 - 23	Done	Questionnaires, clip-boards., pencils & erasers attached	Mar. 11, 13, & 15
Done	Meet with Principles	Wk. Feb. 17 - 23	Done	Phone Env't Canada- weather, temperature	Mar. 11, 13, & 15
Done	Meet teachers-time/date classrm, contact. parents	Wk. Feb. 17 - 23	Done	If Outside - artifacts & rope and set it up	Mar. 11, 13, & 15
Done	In-Ser.Manual to reviewers	Wk. Feb. 17 - 23		If Inside - put up Posters	Mar. 11, 13, & 15
Done	Inter. Quest. #1-Printers	Wk. Feb. 17 - 23			
Done	Quest.#1 to interpreters	Feb. 25			
Done	Project WILD - Presenter	Feb. 25			
Done	Send out letters to parents	Feb. 25 to Mar. 1	10:10 to 10:15 A.M.	Arrival of Interpreters & Video Techinicans	Mar. 11, 13, & 15
Done	Match pairs of Interpre.: + into I-E (Gp.1)& I-C (Gp.2)	Feb. 25 to Mar. 1	10:20 to 10:25 A.M.	Arr. of children - + into gp. with inter. & v. t.	Mar. 11, 13, & 15
Done	Phone parents/guardians	Feb. 25 to Mar. 1			
Done	Visit classrooms - Give teacher Pre-Visit Pkg	Feb. 25 to Mar. 1	11:30 A. M.	Children home Interpreters - Quest. #2	
Done	Photocopy inter. consent forms & Quest. # 1 &2	Feb. 25 to Mar. 1			
Done	Contact Co-op Taxi - Van: Dates, Times, Alt. Loc., Pay't	Feb. 25 to Mar. 1	**AFTER**		
Done	Match pairs of children	Feb. 25 to Mar. 1	Done	Debrief I-C & I-E group of interpreters	Mar. 18
Done	Interpreter consent form/ Quest. #2 - to Printers	Wk. Mar. 4 to 10	Done	Book Video Camer & VCR for Mar 29 -Proj.Sup.&Res.	Wk. Mar. 17-23
Done	Children divided into Gp. 1, Gp. 2, & Gp. 3;	Wk. Mar. 4 to 10	Done	Reverse In-Ser. L. T. S for I-C & I-E gp. of interpreters	Mar.25 & 29
Done	Match children with interpreters	Wk. Mar. 4 to 10			
Done	Env't Can.-Forecast	Mar.10, 12 & 14			

Appendix VI

Examples of Letters of Permission and Consent

Principal
Teacher
Interpreter

To the adults of RLS 121 who have volunteered to participate in a programme for children ages 9 to 11 years.

The purpose of this study will be to design and test the effectiveness of an in-service leadership training session for interpreters who offer programmes and services to children.

The primary focus of this study is to address the needs of interpreters and children. This will be done by providing the interpreters with information on (1) effective teaching techniques to use with children and (2) research that identifies learning strategies used by children.

The information and knowledge gained from this study will seek to accomplish the following three objectives.

(1) It will seek to assemble the most recent information that is available in order to give direction to interpreters, docents, and environmental educators on how children process cognitive information;

(2) It will seek to development a programme outline which focuses on children that can be used in the education of natural history interpreters, docents and environmental educators;

(3) It will seek to describe techniques that will allow interpreters, docents, and environmental educators to modify children's programmes when the need arises.

Interpreter Questionnaire #1 is designed to find out what the adult interpreter's background is in relation to paid and volunteer experiences with children and adults in the instruction of programmes, particularly recreation and leisure. The second questionnaire is designed to: (1) evaluate the in-service training programme; and (2) evaluate the interpreters perception of their delivery of the three common activities that all interpreters are to present to children.

Interpreter Consent Form

I ________________________________ have been informed about the research study that Charlotte A. Martynuik is undertaking and consent to the following:

To allow Charlotte A. Martynuik to use the information that I have filled out in the Interpreter Questionnaires for her study; to have me video taped as I present a natural history interpretative programme to children between the ages of 9 to 11; and to use the information gathered from the taped video as part of her research study.

I understand that I have the option to withdraw **with reason** from the study at any time; I will remain anonymous and if I need to be identified in this research study a pseudonym will be used in replace of my real name (e.g., Interpreter 1); and that the taped video of myself will be erased three months after Charlotte. A. Martynuik's thesis has been accepted by the University of Alberta.

I also consent to not discussing the study including the in-service training sessions and the natural history interpretative programme with any other person (including my peers in RLS 121) except with the Project Supervisor or Charlotte A. Martynuik until after I have attended a debriefing session on March 18, 1991 .

Signature ________________________

Date ____________________

LETTER TO THE PRINCIPAL

This letter contains information on a research project focusing on leadership training of natural history interpreters for children who have a mild developmental disability.

The procedure for this study will include the graduate student coming into Ms. Mr. Teacher's EE3 or Junior Challenge 1 classroom to video tape the students as he or she interacts with the students in order to accustomize them to the video taping procedure. The recorded tape will be viewed by the students and Ms. or Mr. Teacher, and then erased. Ms. or Mr.Teacher will be requested to match pairs of her or his students under the criteria of behaviour and academic ability. One group of these students will be randomly selected to participate in the experimental portion of the study and the other in the control portion.

The main portion of the study will have the students participate in a natural history interpretative programme under the leadership of adult interpreters. The primary focus of the video technicians taping will be on the interpreters interaction with the children.

When the outdoor ambient temperature plus the wind chill is equal to or greater than -15^0 C the equipment, the operation of the equipment, and the negative effects on the interpreters, the children and the technicians would be such that it would be impossible to run the programme outdoors. Therefore prior arrangements will have been made to hold the programme indoors if such adverse conditions exist.

The graduate student well contact Ms. or Mr. Teacher : request the participation of his or her students; provide a description of the study and the role of the students; provide the information for matching pairs of students; receive permission to contact the parents or guardians of the students and get their addresses and phone numbers; set dates and times for the field trip and make alternate arrangements encase of inclement weather.

After permission from Ms. or Mr. Teacher the parents or guardians of the students will be contacted to request the participation of their children in the study. The School, Ms. or Mr. Teacher, and parents or guardians of the students have the option of withdrawing the students from any portion of the study. In order to ensure confidentiality the only person that will view the recorded video tape will be the author. To ensure confidentiality of the children, Ms. or Mr. Teacher and adult interpreters the recorded video tape will be erased three months after the thesis has been accepted by the University of Alberta.

This study will use the term mild developmental disability in place of the term educable mentally handicapped (EMH).

The information and knowledge gained from this study will seek to accomplish five objectives.

(1) It will seek to assemble the most recent information that is available in order to give direction to interpreters, docents, and environmental educators on how children with a mild developmental disabilities process cognitive information;

(2) It will seek to development a programme outline which focuses on children who have a mild developmental disability that can be used in the education of natural history interpreters, docents and environmental educators ;

(3) It will seek to describe techniques that will allow interpreters, docents, and environmental educators to modify regular children's programmes for successful use with children who have a mild developmental disability;

(4) It will seek to complement past research that has been undertaken in the area of information processing and interpretation. These areas will be integrated with a focus on children who have a mild developmental disability;

(5) It will seek to identify pertinent areas that still need to be studied and/or areas that need more research for verification for specific applicability.

The results of the first three objectives will appear in the In-Service Leadership Training Manual.

EE3 classrooms, students aged between 9 to 11 years old.
Classroom Visits: February 25 to March 8, 1991
Two schools at one time will participate in the field trip.
Field Trip: Dates - March 11, 15 and 18, 1991
- Time - 10:30 A.M. - 11:30 A.M.

LETTER TO THE TEACHER

Dear__________,

This letter contains a brief description of a research project that focuses on the leadership training of natural history interpreters for children who have a mild developmental disability.

The procedure for this study will include Charlotte A. Martynuik coming into your classroom to video tape the students as you interact with them in order to accustom the students to the video taping procedure. The recorded tape will be viewed by the students and you, and then erased. The students are to be divided into two groups after you have match paired the students in your class. One group of students will be selected to participate in the experimental portion of the study and the other in the control portion.

The main portion of the study will have the students participate in a natural history interpretative programme,which will consist of a field trip, under the leadership of adult interpreters. The primary focus of the video technicians taping will be on the interpreters interaction with the children.

Charlotte A. Martynuik will contact you to : provide a description of the study and the role of the students; provide the information for matching pairs of students; obtain permission to contact the parents or guardians of the students; the address and phone numbers of the parents or guardians; set a date and time for the field trip; and plan alternate arrangements incase of inclement weather.

After permission from you has been given the parents or guardians of the students will be contacted to request the participation of their children in the study. The School, yourself, and parents or guardians of the students have the option of withdrawing the students from any portion of the study. In order to ensure confidentiality the only person that will view the recorded video tape will be Charlotte A. Martynuik. To ensure confidentiality of the children, yourself and the adult interpreters the recorded video tape will be erased three months after the thesis has been accepted by the University of Alberta.

This study will use the term mild developmental disability in place of the term educable mentally handicapped (EMH).

The information and knowledge gained from this study will seek to accomplish five objectives.

(1) It will seek to assemble the most recent information that is available in order to give direction to interpreters, docents, and environmental educators on how children with a mild developmental disabilities process cognitive information;

(2) It will seek to develop a programme outline which focuses on children who have a mild developmental disability that can be used in the education of natural history interpreters, docents and environmental educators ;

(3) It will seek to describe techniques that will allow interpreters, docents, and environmental educators to modify regular children's programmes for successful use with children who have a mild developmental disability;

(4) It will seek to complement past research that has been undertaken in the area of information processing and interpretation. These areas will be integrated with a focus on children who have a mild developmental disability;

(5) It will seek to identify pertinent areas that still need to be studied and/or areas that need more research for verification for specific applicability.

The results of the first three objectives will appear in the In-Service Leadership Training Manual.

Appendix VII

Interpreter Questionnaire #2
and
Summary of Results
for
Section I;
Questions # 24

Interpreter Questionnaire #2

Questionnaire for Interpreters after their Presentation of an
Interpretative Programme to Children.

NAME ______________________________ (__) Group 1 (__) Group 2

SECTION I: EVALUATE THE IN-SERVICE LEADERSHIP TRAINING SESSIONS

Please rate the following on a scale of 1 to 5.

1) LENGTH of the in-service leadership training sessions was
Explain:

1	2	3	4	5
Too Long		Right Length		Too Short

2) PRESENTATION of the CONTENT in the in-service leadership training sessions.was
Explain:

1	2	3	4	5
Boring				Interesting

3) The PRESENTATION of the CONTENT in the in-service leadership training sessions.followed
Explain:

1	2	3	4	5
No Logical Order				Logical Order

4) The CONTENT in the in-service leadership training sessions.provided ____________ information about the children.
Explain:

1	2	3	4	5
Not Enough		Right Amount		Too Much

5) I had ___________ time to prepare for the children's programme after taking the in-service leadership training sessions?
Explain:

1	2	3	4	5
Not Enough		Right Amount		Too Much

6) Did the video tape of children increase your understanding of the children who participated in your programme?
Explain:

1	2	3	4	5
No				Yes

7) Did the video tape of children help you to clarify common characteristics of the children who participated in your programme?
Explain:

1	2	3	4	5
No				Yes

8) Did the video tape of children supplement the content of the in-service leadership training sessions?
Explain:

1	2	3	4	5
No				Yes

9) Did you feel the role playing helped prepare you for your presentation to the children?
Explain:

1	2	3	4	5
No				Yes

10) Did the video tape of your role-playing help you to critique your method of presentation better than just discussing it?
Explain:

1	2	3	4	5
Least Helpful				Most Helpful

11) What did you like MOST about the in-service leadership training sessions?

A)____

B)____

C)____

D)____

12) What did you like LEAST about the in-service leadership training sessions?

A)____

B)____

C)____

D)____

SECTION II: EVALUATE YOUR PRESENTATION OF THE THREE COMMON ACTIVITIES WITHIN THE INTERPRETATIVE PROGRAMME: Learning to Look, Looking to See; Wildlife is Every where; and Everybody Needs a Home

13) Which of the following indicators did you use to judge if the children understood you?

(___) On the basis of the children's body language I felt they understood what I was talking about. **Explain.**

(___) On the basis of the children's attention to the activity/task I felt they understood what they were to do. **Explain.**

(___) On the basis of the children's verbal response I felt they understood the questions I was asking them. **Explain.**

14) Which of the following indicators did you use to judge if the children did not understand you?

(___) On the basis of the children's body language I felt they did not understand what I was talking about. **Explain.**

(___) On the basis of the children's attention to the activity/task I felt they did not understand what they were to do. **Explain**

(___) On the basis of the children's lack of verbal response I felt they did not understand the questions I was asking them. **Explain.**

15) How well do you feel the children understood the CONCEPTS you were teaching them?
Explain:

1	2	3	4	5
Did not Understand the Concepts at all				Understood the Concepts Very Well

16) How well do you feel the children understood the vocabulary you were using in your instruction of the activities?
Explain:

1	2	3	4	5
Did Not Understand the Vocabulary at all				Understood the Vocabulary Very Well

17) The children's behaviour (affective) prompted me to give ______(scale number) feedback.
1 2 3 4 5
All Negative — All Positive

Explain:

18) The verbal response of the children's cognitive ability prompted me to give _______(scale number) feedback.
1 2 3 4 5
All Negative — All Positive

Explain:

19) Demonstration of the children's psychomotor ability prompted me to give _______(scale number) feedback.
1 2 3 4 5
All Negative — All Positive

Explain:

20) Please specify the indicators you used to judge if the children needed more time to understand what you were teaching them?

21) Did the children you worked with need more time to understand what you were teaching them?
1 2 3 4 5
No Additional Time — Much More Additional Time

Explain:

22) Was the children's behaviour what you ____Did NOT Expect ____Did Expect

Explain:

23) Did you change or modify any part of the programme after you had started your presentation?

If No, why?

What feedback from the children did you use that indicated there was no need to change or modify the programme?

If Yes, why?

What feedback from the children did you use.that indicated there was a need to change or modify the programme?

24) In teaching the 3 activities put a check mark against each of the standard terms you used. If you modified the **Vocabulary** indicate the change that you made.

Activity #1: *Learning to Look, Looking to See*

I used the term(s): **OR** **I changed the term(s) to:**

Observe
Careful observer
Observation
Skills
Surroundings
Appreciate
Sense
Environment as being apart of a whole
Community
Respect
Other words

Activity #2: *Wildlife is Everywhere*

I used **OR** **I changed the term(s) to:**

Wildlife
Wild
Domesticated
Environment
Evidence
All over the world
Organisms
Share
Other words

Activity #3 *Everybody Needs a Home*

I used **OR** **I changed the term to:**

Difference
Similarities
Survival Needs
Habitat
Basic Needs
Home
Suitable Arrangement
Space
Shelter
Neighbourhood
Other words:

25) OTHER MODIFICATIONS you made. **Explain**:

26) How did your PERCEIVE, as a percent (%), the amount of time you used the following teaching methods. (The final % should equal 100%.)

	Activity #1 Learning to Look, Looking to See	Activity #2 Wildlife is Everywhere	Activity #3 Everybody Needs a Home
Lecture			
Questions			
Demonstration			
Direction			
Mastery-Drill			
Problem-Solving			
Clarification			
Inquiry			
Dialogue			
TOTAL	100%	100%	100%

Comments:

Responses[a] made by the Experimental Group of Interpreters for Questions 1 to 10, Interpreter Questionnaire # 2, Section 1

Question Number[b]	SCALE 1	2	3	4	5
1	1 Too Long		2 Right Length		Too Short
2	Boring	1	1	1	Interesting
3	No Logical Order		2	1	Logical Order
4	1 Not Enough		2 Right Amount		Too Much
5	Not Enough	2	1 Right Amount		Too Much
6	No		2	1	Yes
7	No			3	Yes
8	No		1	2	Yes
9	1 No		2		Yes
10	Least Helpful		2		Most Helpful

---

[a] The response scores are raw data which are located in the scale for each question.

1 = response of one person; 2 - response of two people; & 3 = response of three people.

[b] See this Appendix for individual question.

Interpreter Questionnaire #2, Section I

Summary of the responses for questions 11 and 12.

11) What did you like MOST about the in-service leadership training sessions?

I-E-2 "The video."
"The discussion on characteristics."

I-E-3 "- allowed me to understand more about dealing with mildly retarded children."

12) What did you like LEAST about the in-service leadership training sessions?

I-E-1 "Vagueness of things - very secretive."

I-E-2 "The partnering up to create our last lesson plans."

I-E-2 "Monotonous."

Question #24, Interpreter Questionnaire #2, Section II.
Terms used by the Control and Experimental Group of Interpreters.

Terms Used	I-C[a]	I-E[a]
Observe	1	1
Observation	1	
Skills	1	
Surroundings	1	2
Sense	1	2
Environment as being ...	2	
community	1	
Respect	1	
Wildlife	2	3
Wild	2	2
Domesticated		1
Environment	2	
Evidence	2	1
Share	2	
Difference	1	2
Similarities	1	1
Survival Needs	1	
Habitat	2	
Basic Needs	1	1
Home	2	3
Suitable Arrangement	1	
Space	2	1
Shelter	2	2
Neighbourhood	1	
[b] Trade		1

[a] The number of I-C (control) and/or I-E (experimental) group of interpreters who used the standard term.

[b] This term was added to the list by one of the experimental interpreters as having been a term she used in the presentation of her natural history interpretative programme.

Question # 4. Interpreter Questionnaire #2. Section II.
Terms that were Modified by the Control and Experimental Group of Interpreters.

Terms Modified	I-C[a]	I-E[a]
Observe	Look	See; Look
Careful Observer	Careful looker	What can you see
Observation	Looking	things
Skills		Area
Surroundings	Environment; Everything around us	Hear, see, smell; I broke down the senses
Sense	Smell, hear, see	
Community	Area	Animals
Wildlife	Animals	Pets
Domesticated	Tame; Pets	Surrounding
Environment		what can you see that tells you ________
Evidence		
Organisms	Living things; Animals	The same
Similarities	How r [sic] things alike	Need to live
Survival Needs		
Habitat	Home	
Basic Needs		Home

[a] The modified terms used by the I-C (control) and/or I-E (experimental) group of interpreters.

Results from Question #24[a] Interpreter Questionnaire #2, Section II.

	Number of Terms Used[b]	Number of Terms Changed[b]
Interpreter		
I-C-1	20	4
I-C-2	3	10
I-C-3	10	1
Total	33	15
I-E-1	10	6
I-E-2	6	3
I-E-3	7	11
Total	23	20

[a] Question # 24 - "In teaching the 3 activities put a check mark against each of the standard terms you used. If you modified the Vocabulary indicate the change that you made."

[b] The numbers of both columns are raw data and have not been revised. That is, the raw data includes a count for each time a term was used.

Appendix VIII

Pre-Visit Package:

Information about the:
Field Trip
Match Pairing the Children
3 Project WILD Activites

Letter to Parents & Consent Form

FIELD TRIP

DATE: March ____, 1991	TIME: 10:30 - 11:30	TEACHER:
SCHOOL:		

PARENTAL CONSENT FORMS: **PLEASE** bring with you a copy (or original) of each Parental Consent Form that has been returned. I am required by University of Alberta policy to retain a copy of the forms for a period of time. **PLEASE** inform me at least four days prior to the field trip if there is a child whose parent or guardian has not granted permission to participate in the study. This information can be sent together with the list of "matched pairs of children" (SEE Match Pairing of Children).

LOCATION: The Capital City Park Trail between Emily Murphy Park and Hawrelak Park. Drive into Emily Murphy Park from Saskatchewan Drive or the south side of Groat Road Bridge. Once you have entered the park drive down the hill and turn left (west) past the picnic shelter on your left side. Continue to drive under the Groat Road Bridge to the end of the road. See MAP #1for details.

WEATHER CONDITIONS: If the outdoor ambient temperature plus the wind chill is equal to or greater than -15 ^{0} C the natural history programme will be moved indoors.

ALTERNATE LOCATION: The natural history interpretative programme will be moved into classrooms in the Van Vliet Physical Education and Recreation Centre. The meeting place will be the at the East wing of the Van Vliet Centre which is on 117 Street between 87 Avenue and 89 Avenue opposite St. Joseph's College and the Education Car Park. See MAP #2 for details.

FINAL DECISION of LOCATION of PROGRAMME: The Department of Recreation and Leisure Studies Office opens at 8:30 A.M. The department secretary will have the information as to where the natural history interpretative programme will be held. Please phone her (492-5171) between 8:30 A.M. and 9:00 A.M. on the morning of your students participation in the programme.

PARKING: For those teachers who are providing transportation there is parking on site at Emily Murphy Park. If the ALTERNATE location is used because of inclement weather parking will be available in the Education Car Park. If I do not have the names of the individuals who will be transporting the children will you please provide me with the names at least four day prior the field trip (this list can be included with the "matched pairs of children" - SEE Match Pairing the Children). Each driver will have to tell the attendant his or her name for entrance into the car park. The initial cost is $6.00 with a portion being refunded upon leaving the car park. Please have each driver ask the attendant for a receipt when he or she leaves the car park and I will refund the final amount paid for parking once I have received the car park receipt.

CLOTHING REQUIREMENTS: The children should be dress appropriately for the weather of the day. They will be staying outside for an hour therefore, a warm winter jacket, ski pants or wind pants, warm winter boots, mitts, hat and scarf. If the weather is quite warm out and there is "no" snow winter boots or rubber boots are still recommended because the trails may be muddy and wet.

IDENTIFICATION of CHILDREN on the FIELD TRIP: Each child should have on their jacket his/her name written on a name tag which would be visible to the Interpreters.

ROLE of the TEACHER: The Interpreters will maintain control of the class. The teacher will be responsible for the discipline of the children. If the alternate location for the field trip is used then the teacher will be requested to accompany the Interpreter and those children who will not be participating in the study.

OUTLINE of the NATURAL HISTORY PROGRAMME: Enclosed is a copy of the 3 activities that all the children will be participating in. The themes to the activities will remain the same but modification will be made. The activities come from the Project WILD Activities Guide.

PLEASE arrive 10 minutes ahead of the starting time of the programme.

Match Pairing the Children

Match pair only those children who have a mild developmental disability and are between the ages of 9 and 11. The criteria to use: (a) cognitive ability and (b) behavior. Match pairs of children who are most similar in their cognitive and behavioural abilities. The specific criteria you use is left up to your discretion.

SUGGESTIONS:

(1) You could rate each child on a five point scale with 1 being the WORST behaviour/cognitive ability and 5 representing the BEST behaviour/cognitive.ability.

(2) You could subdivide behaviour and cognitive ability into smaller units (e.g., attitude, attending behaviour, reading ability, language ability) and have each of these on a five point scale as described in #1 above.

After each child has been rated then match the two children who have the highest score for each of the scales and continue matching until all the children have been paired. All I need is a list of the children's names in two columns identifying the pairs of children. I do not need to know what ratings you gave the children.

A separate list will identify those children who are older or younger, or have other disabilities besides the mild developmental disability. These children will also be participating in a natural history interpreter programme but will not be included in the research study.

PLEASE match pair your children and send the list to me at least one week prior to the children participating in the field trip (the postal service is not always reliable). The enclosed SELF-ADDRESSED/STAMPED ENVELOPE is to be used for you to send me the list of children as described in the preceding paragraphs.

Three Activities from the Project WILD Activity Guide

Activity One: Learning to Look, Looking to See (p. 280-282)

Age: Grades K-8

Subjects: Language Arts, Science, Social Studies, Art

Skills: description, discussion, listing, observation

Duration: 20-45 minutes

Group size: any

Setting: outdoors and indoors

Conceptual Framework Reference: V.I.B., VI.B.2., I.

Key Vocabulary: observe, see, appreciate, sense

Objectives

Students will be able to:

1) describe differences seen in an environment as the result of casual and detailed observation; and

2) give reasons for the importance of looking closely at any environment.

Method

Students list what they remember seeing in a familiar environment, check their accuracy, and discuss the results; and then apply their experiences and new skills to an unfamiliar outdoor setting.

Background

NOTE: Use this as an introductory activity, especially for activities requiring observation skills.

Looking and seeing can be entirely different things, depending on who we are, where we are, what we are concerned about, and our purposes for looking. We look at our classrooms every school day, but if questioned about simple details, we may find that we are totally unaware of the existence of certain objects, colours, sounds, and textures. As we walk through our neighbourhoods, we have probably learned to notice only those things that are necessary to aid us in getting to our destination. We may not see a soaring hawk, although we may be looking at the sky. We may not see a community of ants, even though we are looking at the sidewalk. During a walk in the woods, we may leave the trail to see a tree better - and then not see the wildflower we trample, even though we are looking at the forest floor as we walk to the tree.

Each of us can train ourselves to see. It takes at least three elements: 1) to learn to be a careful observer, even if we do not have sight through our eyes; 2) to be aware of our surroundings; and 3) to recognize any part of larger whole. As we enter a forest community, for example, we are a part of that community as much as we are part of out school community or neighbourhood community. At some level, we are members of any community we enter. As a result, we have an opportunity and an obligation to see our neighbours and to be responsible members of each community we enter.

The major purpose of this activity is for students to be given an opportunity to enhance their powers of "seeing".

Material

note pads

Procedure

1. Let's practice seeing things. Cover a desk, bulletin board, other wall display, or table with a large sheet before students come to class. Ask the students to write down all the things they thought they saw there before the area was covered. When their lists are completed, ask them to turn over their papers. Remove the sheet. On the back of their first lists, have the students make a new list of what they see. What kinds of things did they remember? What kinds of things were most often missed? Let them come up with reasons why they think this happened.

2. Have the students go outdoors and pick one spot near a tree, a fence, a brook, a field, etc. Each student should find a spot alone, at least 15 meters from the closest human neighbour. Allow 15 minutes for this solo, or approximately five minutes for younger students. **The students should look in a broad sense of the word - seeing, touching, listening, and smelling.** They should record everything they "see". (See "Wild Words" for a journal-making activity to use in recording their observations.) Fifteen minutes will provide time for an initial spurt of observations, a plateau, and then another spurt as they begin to realize how much they missed the first time around. (Younger children need only record in their minds; no need to write.)

3. Bring the students together for a discussion, centring on the process they went through as well as their list of sightings. Did they focus on any one area for a long time? Did they continue to shift their gaze? How did they focus their hearing and smelling? Cupping hands around their ears to simulate animal hearing has a dramatic effect on abilities to hear. Blindfolding seems to cause a compensation toward better hearing as well. Moistening the under-surface of the nose and the entire upper lip area increases smelling ability. NOTE: Our role as teachers is a difficult one in that we are most effective when we teach our students **how** to look and see without telling them **what** to see.

4. Talk with the students about the joy and importance of seeing as fully as we can - as a way of appreciating, respecting, and learning more about the world in which we live. Older students: Discuss the importance of careful observation of our environments beginning with the basis for our fundamental life support systems - air, water, soil plants, animals.

5. OPTIONAL, with older students: Talk about the process of continuing to develop our senses as being a life-long process for each of us. We are always learning and can learn even more. Sensing more in our surroundings can help us detect changes in our environment, cause us to become curious and ask questions, and help us to become better, more aware and informed decision-makes.

Extensions

1. Blur your eyes. What patterns and shapes do you see?

2. What else did you see? Any living things? What were they? Were they plant or animal?

3. Categorize what was observed as living/non-living - and/or as animal, plant, mineral.

4. Play the game "Animal, Vegetable, Mineral" or "What Am I?"

Aquatic Extension

Pick the nearest water in the outdoors you can think of. It might be a drinking fountain, a sprinkler hose, a pond, a stream, of the beach. Try to imagine it clearly in you mind. Draw a picture showing as much detail as possible of the water and its immediate environment. Includes any wildlife and vegetation you think may be in the environment nearby and in the water. Did you leave anything our? Now, or as soon as possible, take you drawing to the spot. Look around. Make a written list of anything you did not include in you drawing. Add to you drawing to make it complete.

Evaluation

Think of three of your friends. Without looking at them, write down the colour of their eyes and a description of what they were wearing last time you were together. Check to see if you were right.

Activity Two: Wildlife is Everywhere! (p. 18-19)

Age: Grades K-3 (and older)
Subject: Science, Language Arts
Skills: analysis, discussion, generalization, observation
Duration: 30 to 45 minutes
Group Size: any
Setting: indoors and outdoors
Conceptual Framework Reference: I.B., I.B.1., I.B.3.
Key Vocabulary: wildlife, wild, domesticated, environment, evidence

Objectives

Students will be able to:
1) state that humans and wildlife share environments; and
2) generalize that wildlife is present in areas all over the earth.

Method

Students search their environment for evidence of wildlife.

Background

People often think of wildlife only as large animals like those they see in pictures of Africa with lions and elephants. They might think of creatures of the North American forests that they have seen themselves, like deer and elk. But wildlife includes all animals that have not been domesticated by people.

Domesticated animals are those that have been tamed, made captive and bred for special purposes. Farm animals and pets are considered domesticated animals. (See "What's Wild?" and "Animal Charades".)

Wild animals are all the rest. What may be surprising is that wildlife includes the smallest animal organisms - even those that can be seen only through a microscope. Spiders, insects, reptiles, worms and most species of fish, birds, and mammals may be considered wildlife. Wildlife occurs in a tremendous variety of forms and colours. And wildlife can be found all around us. Even when we think we can see or hear no animals at all - they exist somewhere around us - maybe even under our feet! There are even tens of thousands of life forms on our skin, in our hair, and inside our bodies! In fact, each or us would die if all the organisms that inhabit our bodies were to disappear. People are never truly alone in an environment. Some form of wildlife is near.

The major purpose of this activity is for students to understand that people and wildlife share environments. By investigating microenvironments or microhabitats, the students should be encouraged to generalize from the information they acquire to the entire planet, coming to the understanding that wildlife exists in some form in all areas of the planet. In the deserts of the southern hemisphere; the oceans, tropical jungles, and cities of the earth; from the Antarctic snow fields to the glaciers of the Arctic region, wildlife exists in a variety of forms.

Materials

string (optional)

Procedure

CAUTION: Ask students to observe but not touch or disturb animals they see.

1. Invite your students to explore the classroom, looking for signs of wildlife. Even in the most cleanly-swept classrooms, you can usually find some

signs of life- either past or present. It might be a spider web, dead insects near lights, or insect holes along baseboards and behind books. After the search and a discussion with the students about what - if anything - they found, introduce the idea that people and other animals share environments. Sometimes we don't even notice that we are sharing our environment with other living things, but we are.

2. Expand the search for other animals to the out-of-doors. Take the students on the schoolgrounds and give everyone, working in pairs, five minutes to find an animal or some sign that an animal has been there. Look for indirect evidence, such as tracks, webs, droppings, feathers, and nests. (Be sure not to harm or seriously disturb anything.) After five minutes, sit down and talk about what everyone found. Or, in advance, create a wildlife trail for your students to follow - looking for signs of animals along the way - by placing a long piece of string around an area of the schoolgrounds and "salting" the path along the string with evidence of animals" bones, feathers, etc. The students can explore the trail in a "follow the leader" fashion. The students should remain quiet, observing to themselves. At the end of the trail, everyone should sit and discuss what they saw.

3. Talk with the children about what they learned. Emphasize that they have seen that people and wildlife share environments. They have seen evidence of wildlife at their school. Ask the children to guess whether they think different kinds of animals are found all over the earth - in the deserts, oceans, mountains, and cities. They may harvest their own experiences and talk about places they have been and animals they have seen. Encourage the students to make the generalization that wildlife is present all over the earth.

Extensions

1. Survey your yard, kitchen, neighbourhood, or city park ... looking for wildlife.

2. Search magazines and books for wildlife from all over the planet.

3. "Invent" names and describe the wildlife found outside during searches. Older students can observe the animals, write a written description - and then check their invented names and descriptions against the scientific names and information found in reference materials.

4. Use maps. Look up names of towns and cities with wild animals names!

Aquatic Extension

Survey your schoolgrounds or neighbourhood for any possible aquatic habitats for wildlife. Check puddles, sprinkler systems, and if possible, streams, beaches, ponds, etc. Look for evidence - direct or indirect - of any wildlife that lives in or near these water-related areas. Tell someone what you find - or show them, taking care not to damage any wildlife you find or its habitat!

Evaluation

1. In which of the following places would you be likely to find animals living: in a forest; in a hot, dry, desert; in a lake; at the top of a mountain; at the North Pole; in Metropolitan Toronto. What kinds of animals might you find in these places?

2. Name any areas on earth where you couldn't find any animals.

3. Name the things you saw, heard, or smelled which showed you that wildlife lives in the classroom and on the schoolgrounds.

Activity Three: Everybody Needs a Home (p. 26-27)

Age: Grades K-3
Subjects: Science, Language Arts, Art
Skills: analysis, comparing similarities and differences, discussion, drawing, generalization, visualization
Duration: 30 minutes or longer
Group Size: any; however, no more that 25 students is recommended
Setting: indoors or outdoors
Conceptual Framework Reference: I.A., I.A.4., I.C.1., I.C.2.
Key Vocabulary: differences, similarities, survival needs, habitat

Objective

Students will be able to generalize that people and other animals share a basic need to have a home.

Method

Students draw pictures of homes and compare their needs with those of other animals.

Background

Humans and other animals - including pets, farm animals, and wildlife - have some of the same basic needs. Every animal needs a home. But that home is not just a "home" like people live in. Home, for many animals, is a much bigger place - and it's outdoors. The scientific term for an animal's home is "habitat". An animal's habitat includes **food, water, shelter,** or **cover,** and **space**. Because animals need the food, water, shelter, and space to be available in a way that is suitable to the animals' needs, we say that these things must be available in a suitable **arrangement**.

The major purpose of this activity is for students to generalize that animals need a home. Homes are not just houses. A house may be considered shelter. People build houses, apartments, trailers, houseboats, and other kinds of shelter in which to live. Animals don't need a home that looks like a house - but they do need some kind of shelter. The shelter might be underground, in a bush, in the bark of a tree, or in some rocks.

Everybody needs a home! And "home" is bigger than a "house". Home is more like a "neighbourhood" that has everything in it that is needed for survival.

Materials

drawing paper, crayons or chalk

Procedure

1. Ask each student to draw a picture of where he or she lives - or to draw a picture of the place where a person they know lives. Ask the students to include pictures in their drawing of the things they need to live where they do; for example, a place to cook and keep food, a place to sleep, a neighbourhood.

2. Once the drawings are finished, have a discussion with the students about what they drew. Ask the students to point out the things they need to live that they included in their drawings.

3. Make a "gallery of homes" out of the drawings. Point out to the students that everyone has a home.

4. Ask the students to close their eyes and imagine: a bird's home, an ant's home, a beaver's home, the Prime Minister's home, their home.
OPTIONAL: Show the students pictures of different places that animals live.

5. Discuss the differences and similarities among the different homes with the students. Talk about the things every animal needs in its home: food, water shelter, and space in which to live, arranged in such a way that the animal can survive. Summarize the discussion by emphasizing that although the homes are different, every animal - people, pets, farm animals, and wildlife - needs a home. Talk about the idea that a home is actually bigger that a house. In some ways, it is more like a neighbourhood. For animals, we can call that neighbourhood where all the survival needs are net a "habitat". People go outside their homes to get food at a store, for example. Birds, ants, beavers, and other animals have to go out of their "houses" (places of shelter) to get the things they need to live.

Extensions

1. Draw animal homes. Compare them to places where people live.

2. Go outside and look for animal homes. Be sure to not bother the animals - or the home - in the process!

Aquatic Extension

Draw the "homes" of some kinds of aquatic wildlife. Fish, aquatic reptiles, amphibians, aquatic insects, and aquatic mammals - just like all other kinds of wildlife - need **food, shelter, and space in a suitable arrangement**. These are the basic components of an animal's habitat or home.

Evaluation

Name three reasons why people need homes, and three reasons why animals need homes.

The above three activities were used:

By permission of the Canadian Wildlife Federation.
c Canadian Wildlife Federation/Western Regional Environmental Education Council. Project WILD Activity Guide. Ed. by Luba Mycio-Mommers. Ottawa: Canadian Wildlife Federation, (1985).

LETTER TO PARENTS OR GUARDIANS

This letter is to request permission for your child _________________________ to participate in a research project focusing on leadership training of natural history interpreters for children who have special needs.

The procedure for this study will include the researcher coming into your child's classroom to video tape the teacher as the students interacts with him/her in order to accustom them to the video taping procedure. The recorded tape will be viewed by the students and the teacher and will then be erased.

The main segment of the study will have the students participate in a natural history interpretative programme under the leadership of adult interpreters. Prior to the programme the teacher will be requested to match pairs of her or his students. One group of these students will be randomly selected to participate in the experimental portion of the study and the other in the control portion. Both the experimental and the control portions of the study will be video taped. The video technicians who will be taping on this occasion will focus on the interpreters interaction with the students.

You, as parents or guardians of ________________________________, have the option of withdrawing your child at any time from any portion of the study. In order to ensure confidentiality the only person that will view the recorded video tape will be the graduate student. To ensure confidentiality of the children the recorded video tape will be erased three months after the thesis has been accepted by the University of Alberta.

The in-class video taping will take place sometime in the weeks of February 25-March 1 or March 4-8, 1991. The field trip portion (Natural History Interpretative Programme) of the study will take place on March 11, or March 15, or March 18, 1991 in the morning and will be held outdoors. If the weather is too inclement the students will then be moved indoors for the Programme.

The children should leave home the day of the field trip appropriately dressed for the weather of the day. They will be staying outside for an hour therefore, a warm winter jacket, ski pants or wind pants, warm winter boots, mits, hat and scarf. If the weather is quite warm out and their is "no" snow winter boots or rubber boots are still recommended because the trails may be muddy and wet.

The children will be transported from the school to the site of the programme and back to the school. There is no cost to the parents/guardians for this field trip.

I hope that your will agree to have your child participation in this study. Please complete the enclosed form giving your consent and return it to school tomorrow.

Thank you in advance for you assistance.

Yours Sincerely,

Charlotte A. Martynuik

I ______________________________(mother/father/guardian), give permission for my child ______________________________to take part in the leadership training study.

I also give my permission for ______________________________to be video taped in the classroom and during his/her participation in the natural history interpretative programme, and to be driven from the school to the study site and back to the school. Information is to remain anonymous on the written findings of the study.

Signed______________________________

Date____________________

Appendix IX

Examples of Letters of Thanks

C. A. Martynuik
Department of Recreation and Leisure Studies
E-401 Van Vliet Physical Education and Recreation Centre
University of Alberta
Edmonton, Alberta
T6G 2H9

March 21, 1991

Instructor
Radio and Television Arts Department
NAIT
11762 - 106 Street
Edmonton, Alberta
T5G 2R1

Dear Mr. Instructor,

Thank you for taking time out of your busy schedule to assist me in my study. I appreciate the effort you make in finding students who were available to video tape aspects of my research as part of my data collection. I found the students, (named each of the students), to be reliable and professional in their work and care of the video equipment. I have scanned the work they did and am pleased with the results. I know that the conditions were probably not ideal or what they were use to but I do hope they enjoyed the experience.

I have enclosed a reference letter for each of the students and a small show of appreciation for each of them. I realize that it is not much but I do recognize that they took time out of their own schedule to provide me with an important service and to accommodate my timetable.

Thank you again for your support of my study.

Sincerely,

C. A. Martynuik

C. A. Martynuik
Department of Recreation and Leisure Studies
E-401 Van Vliet Centre
University of Alberta
T6G 2H9

March 21, 1991

Name of Principal
Elementary/Junior High School
Street Address
Edmonton, Alberta

Dear Mr. Principal,

Thank you for your show of support for my research by giving your permission for the students from Ms. Teachers' class to take part in my research project. Even though it was cool morning the students overall appeared to have enjoyed themselves. I do hope they had a good time.

The field trips for the various schools in my study has now been completed and I will now start the process of analyzing the data. A final report of my study will be submitted to the Edmonton Catholic Schools Central Office sometime in the fall of 1991. If you have any questions about the study please call me at 492-4622. If I am not available please leave a message and I will return your call.

Sincerely,

C.A. Martynuik

C. A. Martynuik
Department of Recreation and Leisure Studies
E-401 Van Vliet Centre
University of Alberta
T6G 2H9

March 21, 1991

Name of Teacher
Elementary/Junior High School
Street Address
Edmonton, Alberta

Dear Ms. Teacher,

I appreciate the support you have shown for my research by making it possible for the students in your class to take part in the study. Besides being a bit cold near the end of the programme the students seem to have enjoyed themselves. I hope they had a good time.

All the data for my study has now been collected. I will now start the process of analysis. The Edmonton Catholic Schools Central Office should have my final report on the results of my study sometime in the fall of 1991. If you have any questions about the study please call me at 492-4622. If I am not available please leave a message and I will return your call.

Sincerely,

C. A. Martynuik

Appendix X

Example of the
Observational Recording Chart

RFC of the Primary and Secondary Level Teaching Methods

Observational Recording Chart for the Scripted Video Tapes.

Page #	Primary [1]	Secondary [1]	Page #	Primary [1]	Secondary [1]
	Total	Total		Total	Total

[1] Primary and Secondary Level teaching methods refer to: demonstration, direction, mastery, clarification, lecture, question, problem-solving, inquiry and dialogue. (See Appendix IX for Definitions of Teaching Methods, Ground Rules and Clarification of Teaching Method Definitions).

The Revised Frequency Counts of the Primary and Secondary Level Teaching Methods for each member of the Control and Experimental Group of Interpreters

Primary Level Teaching Methods [1]

Group	Greater Usage	Lesser Usage	Equal Usage
I-C-1	105.8	10.5	0.8
I-C-2	64.0	21.3	0.0
I-C-3	48.4	17.5	0.0
Total	218.0	49.3	0.8
I-E-1	76.9	16.4	1.5
I-E-2	102.0	10.0	0.5
I-E-3	40.3	33.2	0.8
Total	219.3	59.6	2.8

Secondary Level Teaching Methods[1]

Group	Greater Usage	Lesser Usage	Equal Usage
I-C-1	41.3	180.8	107.3
I-C-2	54.5	296.8	33.2
I-C-3	25.9	171.7	66.7
Total	121.6	649.2	347.5
I-E-1	81.5	342.1	43.6
I-E-2	39.0	144.0	50.0
I-E-3	33.2	203.5	18.2
Total	153.6	689.8	111.7

[1] Teaching methods in the categories for:
Greater Usage - demonstration, direction, mastery and clarification;
Lesser Usage - lecture, question and problem-solving; and
Equal Usage - inquiry and dialogue.